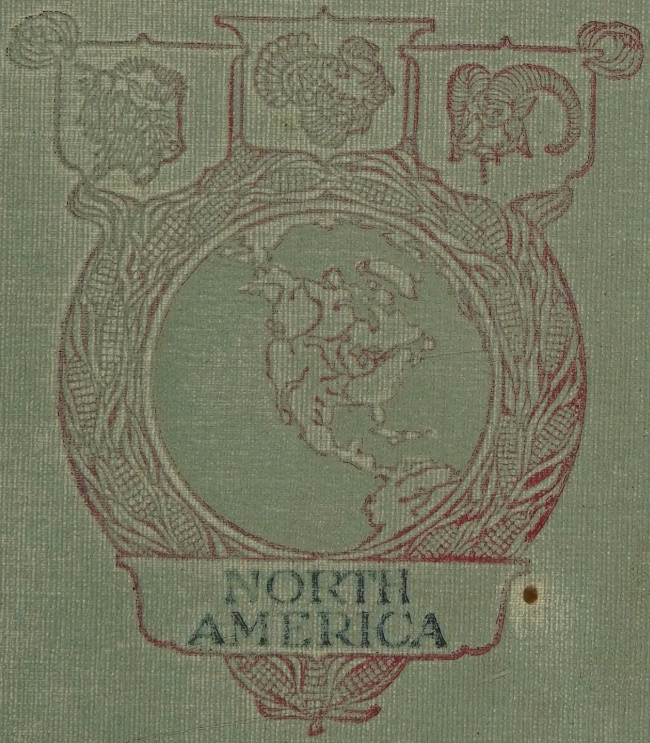
CARPENTER'S GEOGRAPHICAL READER



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St. Lawrence R.
Montreal
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White Mts.
N.H.
VERMONT
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L. ONTARIO
Welland Canal
Niagara Falls
Buffalo
ALBANY
Erie Canal
Hudson R.
CONN. R.
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New York Bay
Jersey City
NEW JERSEY
Philadelphia
Delaware R.
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C. May
Baltimore
Chesapeake Bay
Norfolk
C. Hatteras
Wilmington
C. Fear
Charleston
Savannah
Jacksonville
C. Canaveral
Tampa
Everglades
C. Sable
Key West
Florida Strait
BAHAMA ISLANDS
HAVANA
CUBA
ATLANTIC OCEAN
GULF OF MEXICO
Minneapolis
ST. PAUL
MINNESOTA
WISCONSIN
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Cairo
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Missouri R.
Mississippi R.
Illinois R.
Tennessee R.
Arkansas R.
Red R.
Sabine R.
Alabama

CARPENTER'S GEOGRAPHICAL READER

NORTH AMERICA

BY

FRANK G. CARPENTER

NEW YORK ·:· CINCINNATI ·:· CHICAGO
AMERICAN BOOK COMPANY

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CARP. N. AM.
E. P. 57

PREFACE

THE purpose of this book is to give to its readers a living knowledge of some of the wonders of the country and continent in which they live. Upon a personally conducted tour they are taken by the author through the most characteristic parts of the North American continent. They travel through the United States, British America, Mexico, and Central America, studying the most interesting features of life and work among the people of each country, learning how they are governed, and what they do in order to make a living. Much information is also given concerning the natural resources and the physical features of the countries visited.

The greater part of the journey is taken in the United States. Here the young Americans learn what makes us a great nation, and see for themselves the sources of our national wealth. They visit our chief cities. They go through the cotton and tobacco plantations of the South, linger under the orange groves of Florida, and spend some time among the vast corn and bread lands of the North. They travel over the plains, visit the arid regions and the irrigation works which are reclaiming some of them. They learn, also, of our great swamps and their drainage.

They go down into the mines and see how coal, iron, copper, gold, and silver are taken out of the depths of the earth and turned to the use of man. They spend days in the forests visiting the lumber camps and learning about the wood lands and our National Forest Reservations. They see the great natural wonders of our country, now

staying awhile at Niagara Falls, now drifting down through the Grand Canyon of the Colorado, now resting under the shadow of the big trees of California, and later on wandering about among the wonderful geysers of the Yellowstone Park.

From Puget Sound they sail north to Alaska, the land of ice, gold, coal, and seals, and thence travel up the Yukon River and over the frozen plains to the Mackenzie. After exploring the great fur lands of the northern part of our continent, they return southward and visit the settled parts of Canada, including the western wheat belt, the manufacturing east, as well as the capital and other chief cities.

From Halifax they take ship for Mexico, going almost directly from the cold lands of the North to the semi-tropical regions of our sister republic. They ascend Popocatepetl, travel over the Mexican plateau, and then, after a journey through Central America, they sail through the Panama Canal, and back to New York.

These imaginary tours which the children make will, it is believed, not only give them much valuable information of a practical character, but will inspire them with intelligent patriotic motives and with a commendable pride in our country's institutions. Used as a supplementary reader in connection with the geographies studied at school, the book will aid in imparting a living interest to the lessons therein contained, and will be found to be a valuable aid in explaining and fixing in the mind many interesting facts which might otherwise be but imperfectly apprehended.

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TRAVELS THROUGH
NORTH AMERICA

I. GENERAL VIEW OF NORTH AMERICA

WE start to-day upon our travels through North America. We are about to explore one of the most wonderful parts of the globe. It is the grand division in which we live, and most of our time will be spent in that section of it known as the United States, which we are proud to call our own country.

What would you think of a farmer who did not know his own farm, or what he had on it? A wise landowner will know just where the boundaries of his possessions are and what line fences separate him from his neighbors. He will know every hill and valley, every pond and stream. He will go through the woods to see if there is any game, and will drop his fishing line into the streams and ponds to learn about the fish. He will try to learn what kind of crop each field will produce, and over what roads he can most easily carry it to market. Perhaps he will dig in the hills to see if they contain coal, iron, or copper; and if any one tells him there is gold or silver on his farm, you may be sure he will not rest until he finds just where it is. He will ask all sorts of questions about his neighbors: what kind of people they are, and just how they live; and he will

not stop until he is aware of everything that is going on around him.

Now the boys and girls of this country, together with their parents, are the owners of the vast tract of land called the United States. It is a part of the grand division of North America; and we, as its possessors, are interested in knowing all about its extent, its resources, and various other features, and also about those of our sister countries upon it. This is what we shall try to learn in the travels we are going to take in this book.

Before we start, let us have a bird's-eye view of the country. Suppose, for the moment, that we can take a trip to the moon, and have there a telescope so powerful that we can see the whole world; what sort of a picture does our continent make when thus spread out before us?

We see that North and South America are two vast peninsulas, each almost surrounded by water. North America is the larger, and the narrow Isthmus of Panama, with its luxuriant vegetation, looks like a green chain connecting the two. We see that North America lies in almost the shape of a triangle, the northern and eastern sides of which are of much the same length. Upon each of these two sides is a great silvery spot where the waters from the ocean extend into the land. That on the north lies not far from the middle of the line, and is Hudson Bay; while that on the east lies near the foot of the line at the south, and is the Gulf of Mexico, with the green island of Cuba bordering its edge.

As we stand upon the moon, we may take a rapid glance about the coast of this vast country. There, at the northwest, is Bering Strait, a thin line of silvery water less than forty miles wide, which separates North America from Asia. Starting from this, our eyes travel southward, along

the western shores of Alaska, the Dominion of Canada, the United States, Mexico, and Central America, to the

North America lies almost in the shape of a Triangle.

Isthmus of Panama. Here we cross, and, turning to the

left, make our way along the coast of the Caribbean Sea and the Gulf of Mexico. Reaching the Atlantic Ocean at the southern point of Florida, we follow its shore line to New York and New England. Farther north we observe the rocky coasts of Newfoundland and Labrador; and then our eyes, dazzled by the snow, roam among the icebergs of the Arctic Ocean until at last they rest again upon our starting point in Bering Strait.

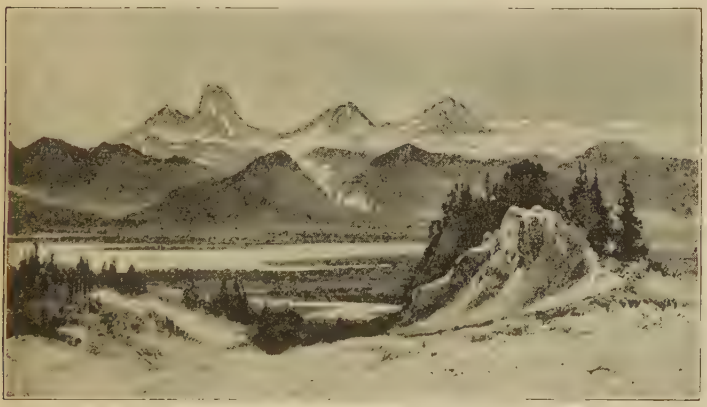
Such a view shows us something of the vast extent of North America. The line about the coast is nowhere regular. It has many capes, bays, and gulfs; and could we measure its windings, we should find that it is almost as long as the distance round the earth.

Within this coast line lies about one sixth of all the dry land on the globe. North America is the third in size among the grand divisions. It is more than twice as big as Europe, and is surpassed in area only by Asia and Africa.

As we look down upon this great territory we see that most of it is made up of plains, and that in general it consists of a great central valley, or trough, running from north to south between high lands and long mountain ranges. The green Appalachians, a little back from the Atlantic Ocean, form the eastern side of the trough; far away in the west are the wide plateaus and the lofty, snow-clad peaks of the Rocky Mountain highland; while between these mountain regions lie the central plains of the Mississippi, the Saskatchewan, and the Mackenzie rivers. These plains reach from the Gulf of Mexico to Hudson Bay and the Arctic Ocean, and form one of the largest valleys of the earth.

Halfway up the valley, near the Great Lakes, the land rises, slightly making the water parting called the

Height of Land. North of the divide, the streams flow to the northeast and north, and empty themselves into the cold waters of Hudson Bay or the Arctic Ocean. South of it they flow southward and are lost in the warm Gulf of Mexico. The slopes of the valley in both directions, however, are so slight that one may travel through it from the



Scene in the Rocky Mountains.

Gulf of Mexico to the Arctic Ocean without perceiving that he is going up or down hill.

Let us now fix the telescope directly upon our own country. There is the United States, lying in the middle of North America. Those broad lands at the north are the Dominion of Canada, while at the south are Mexico and Central America, extending like a handle to the main body of the grand division.

Think of it! All that land between Mexico and the Dominion of Canada belongs to us. What a big country it is! It is so wide from east to west that it takes about five days and nights on a fast railroad train to cross it; and its average length from north to south is thirteen hun-

dred miles. It is one of the largest countries of the world, and, with the territory of Alaska, it has almost as much land as all Europe.

The United States is a rich country. Those mountains on its eastern edge contain millions of tons of iron, and thousands of men are now digging in them to get out the ore. In those same mountains are vast fields of coal, and the streams which flow down their slopes furnish water power for thousands of factories.

The Rocky Mountain highland, in the western part of the country, has vast deposits of gold, silver, copper, and lead, and we shall see the miners taking the metals out of the hills. There are wild animals in the mountains, and during our tour we shall have splendid hunting and fishing.

Between the eastern highlands and the great plateau of the West lies one of the most fertile valleys of the world. See those silvery lines which wind their way through it, as we look down upon it from the moon. They seem but threads at this distance. They are really great rivers, and all parts of the valley through which they flow are well-watered lands. That is the Mississippi Valley, and the band of silver running through it from north to south is the Mississippi River, which, with its great branch, the Missouri, is the longest river on earth.

But what are those shining white patches west of the Appalachians? They look quite large as they lie there below us. Those are the Great Lakes, some of the biggest bodies of fresh water on the globe. They are so large that they seem like seas, and when we travel upon them we shall often be out of sight of land.

The United States is a country of homes. We can see that its surface is peppered with black dots and covered with a network of black lines. Those dots are the cities

and towns, and the lines are the railroads. The United States has more railroads than any other country.

It is one of the busiest of all lands. It contains so many millions of industrious people, engaged in so many different kinds of work, that, as our eyes move across it, we seem almost to hear the hum of the machinery, away up on the moon. The country is so vast that we hardly know where to begin to explore it. But there in the East is its capital, the city of Washington, and from that place we shall start.

2. IN OUR NATIONAL CAPITAL

IT seems strange that our national capital should be so far away from the center of the United States. You might think it ought to be in the Mississippi Valley, about halfway between the Dominion of Canada and the Gulf of Mexico. It lies on the Potomac River, about a hundred miles from its mouth, and only a short distance from the Atlantic coast. It is on the eastern side of the Appalachian Mountains, a long way from the Mississippi Valley, and thousands of miles from the lofty plateaus of the West. The inhabitants of Oregon, California, and Washington must travel five or six days on the cars if they would see the President; and, indeed, most of our people live many hundreds of miles away from the national capital.

Now the capital of a country is where the chief officers of its government live and do business, and the people who have business with the government must go there to see them. If it were not for the railroads, this, for many of us, would be quite inconvenient; and were it not for the tele-

graph and telephone it would be almost impossible to govern such a large country from a city so situated.

Why was the capital located so far from the center of the United States?

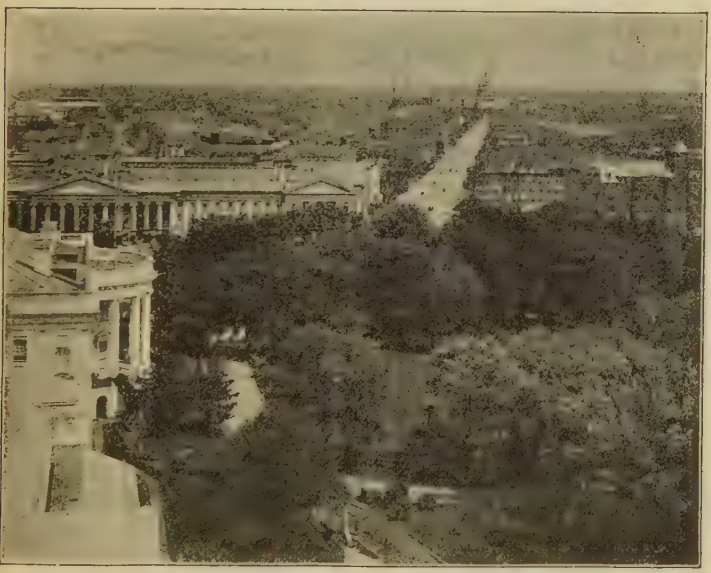
The story is connected with the growth of our country.

When we Americans, by the Revolutionary War, forced England to allow us to govern ourselves, we were few in number, and the most of the people lived east of the Ap

The Old City of Washington.

palachian Mountains. The lands to the westward were held by wild Indians, and deer and bears roamed through the dense forests. We then owned no land beyond the Mississippi River, and no one imagined that the United States would some day extend to the Pacific Ocean. The site of Washington city was then in almost the center of the inhabited country, so that when a location for the capi-

tal had to be chosen, this was thought the best place. Congress was then sitting in Philadelphia. It was before the days of railroads, and President Washington rode in a carriage to the village of Georgetown, which is now a part of the capital, and arranged with the farmers to sell



General View of Washington at the Present Time.

their lands to the government. Soon after this the work of laying out the city began; but it was almost ten years before the White House was finished and a building put up on Capitol Hill in which Congress could come together to make laws.

The first President who lived in Washington was John Adams. He came alone to the capital, leaving his wife to follow him. In doing so, while traveling through the

forest from Baltimore to Washington, she lost her way, and rode for miles without seeing a human being.

At that time a large part of Washington stood in the woods. There were stumps in some of the chief streets,

One of the Small Parks in Washington.

and in wet weather Pennsylvania Avenue was almost a river of mud. The congressmen and other officials did not like the new capital. They nicknamed it the "Wilderness City," the "City of Miserable Huts," and the "City of Streets without Houses." It steadily grew, however, and is now one of the finest cities of the United States.

The plan of Washington is an excellent one. From the Capitol building as a center, the city is laid out in four great parts, in each of which the streets cross one another

at right angles, making them look as if four checkerboards had been there joined together. Through the checkerboards, running in all directions, are wide avenues, and where these avenues cut across the streets there are circles and triangular parks. The circles and triangles are filled with statues, fountains, flowers, and trees, and they form one of the chief beauties of the city.

Why were these little parks so placed?

It was not so much for beauty as for defense. The man who planned Washington was a Frenchman, Major Pierre l'Enfant, who had left Paris about the time of the French Revolution, when the mobs were destroying the government. In laying out our capital he had the bloody scenes of Paris in his mind, and he designed a city which might be easily defended and at the same time be beautiful. Each of the little parks controls several streets, and a cannon placed in its center could be whirled around and thus fire shot down a half-dozen different streets.

We shall take an automobile for our tour through Washington. The city has more than two hundred miles of streets as smooth as a floor. They are paved with asphalt, and are lined with shade trees whose branches often meet overhead, forming long arbors of magnificent maples and elms. The city seems to be built in a forest, with lines of houses rising out of the trees. Along the streets back of the sidewalks are wide strips of green lawn which extend up to the walls of the houses.

We devote our first day to a run about the city. Some of the great government buildings are wide apart, and it is a full mile from the White House to the Capitol, which is situated on a high hill to the eastward.

Farther on we come to the Library of Congress. It covers nearly four acres, and its golden dome, as big as

"We shall take an Automobile for our tour."

the largest circus tent, can be seen shining in the sunlight for many miles about Washington.

Leaving the library, we ride to the navy yard, on the eastern branch of the Potomac. The soldiers guarding the gate allow us to pass in, and we visit the foundries where the great guns for our battleships are made. We next go to the arsenal to watch the parade of the soldiers who are here to guard our capital city, and then make our way back to the White House through the long park known as the Mall, which lies south of Pennsylvania Avenue. This park is filled with beautiful trees, under the branches of which we ride, passing the white stone

"We come to the Library of Congress."

building of the National Museum, going by the great brown-stone castle-like Smithsonian Institution, and then on among the beautiful flower beds behind which stand the offices and laboratories of the Agricultural Department.

A little farther on, we leave the trees and enter a large green field, one edge of which is washed by the waters of the Potomac River, and here we see the high stone shaft built in memory of George Washington.

The Washington Monument is visible from any part of the city. At a long distance it looks like a big piece of

The Smithsonian Institution.

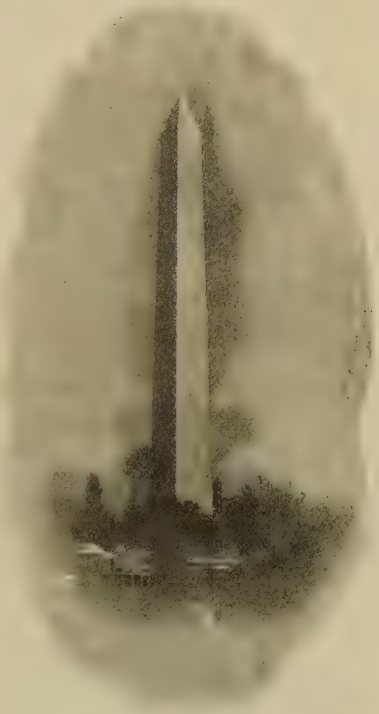
chalk with a well-sharpened point. It seems to grow as we come toward it. It gets bigger and bigger, and as we walk up the little hill on the bank of the Potomac where it stands, and put our chins against its side, and look upward it appears to be a great marble wall built right up into the sky.

The monument is made up of blocks of white marble, so closely joined together that you can hardly see where one stone fits into another. It is fifty-five feet square at the base, and its slope is so gradual that, if you could slice off

the top where the shaft begins to verge to a point, you could build there a house with four large rooms on each floor, and its outer walls would not be outside the monument.

There is an elevator inside this huge structure, and as we ride to the top the man in charge tells us that it is more than five hundred and fifty-five feet in height.

As we stand again at the foot of the monument and look toward the north, we face three of our chief government buildings. There, at the left, is the big granite building of the State, War, and Navy Departments; at the right is the somber gray Treasury, where much of our national money is kept; and in the center shines out the White House, where our President lives.



Washington Monument.

We look at our watches, however, and find that it is too late to do more to-day. It is almost half-past four o'clock, and the government offices are ready to close.

As we reach the Treasury a mass of men and women pours forth from the doors which face Pennsylvania Avenue. At the same time the other departments of the

government dismiss their employees, and the streets are almost blocked with clerks on their way home from work.

We find that it takes several hundred thousand people to do the public work of the United States, and that about thirty thousand persons are needed to keep the books and carry on the national business at Washington.

3. A VISIT TO THE PRESIDENT AND TO THE HALLS OF CONGRESS

OUR first trip to-day shall be to the White House. We are to meet the President of the United States. After that we shall go to the Capitol and see something of Congress and the Supreme Court.

The White House.

Our government is composed of three branches: the legislative branch, or Congress, which makes the laws; the executive branch, consisting of the President and his officials, which carries out the laws; and the judicial, or the courts, established in order to define the meaning of the laws. The President is called the Chief Executive of the United States. He is, in fact, our business manager. He

is elected for a term of four years, and receives a salary of seventy-five thousand dollars a year. He is also allowed twenty-five thousand dollars a year for traveling expenses.

We stroll up past the Treasury, and soon come to the White House grounds. The gates are wide open, and we walk undisturbed along the roadway which leads to the great porch before the front door.

Front Door of the White House.

Here we stop to take a good look at the White House before we enter. It is made of sandstone, but is so painted that it seems like a marble palace shining among the big trees which surround it. A lawn of velvety green lies between it and the sidewalk, and on our way in we pass a fountain which sends thousands of silvery drops high into the air.

The doors before us are of plate glass set in brass frames. A little farther in are other doors of polished mahogany which have brass knobs decorated with stars.

Now the doors have opened and a messenger invites us to enter. We take a few steps and are in the Executive Mansion, in the home of the President of the United States, where all our presidents have lived since the year 1800.

The Executive Mansion was the first public building erected at our National Capital. George Washington selected the site, and was present in 1792 when the corner stone was laid. He lived to see the building completed, for it is said he walked through its rooms only a few days

before his death in 1799. His successor, John Adams, was the first President to occupy it. During the War of 1812 the British captured the city and set fire to the Executive Mansion, burning much of the woodwork and blackening the stone walls. When it was repaired, the walls were painted white, and from that came the name "The White House," by which it is commonly known to this day, although its real title is The Executive Mansion.

The first room we see shows us the size of the building. It is called the Vestibule, but it is four times as big as the ordinary parlor. It has a high ceiling upheld at the back by white pillars, beyond which is the corridor leading to the reception rooms.

Turning to the left through this hall, we first visit the East Room, which takes up the whole east side of the White House. Its ceiling is about twice as high as that of the average schoolroom. The floor is of hard wood, beautifully finished, and so brightly polished that it shines like a mirror.

The walls of the East Room are decorated in white. From its ceiling hang chandeliers, upon which are thousands of pieces of cut glass. In the walls are set four great mirrors, each as big as the largest store window, in which, when the chandeliers are lighted for the President's evening parties, the glass pendants shine like diamonds. At such times there are often great banks of cut flowers below the mirrors, and flowers and ferns are wreathed throughout every part of the vast room. There are palm trees and tropical plants in the corners and in the windows. The parlor is filled with gayly dressed people, and the whole makes one think of fairyland.

At the end of the East Room we enter the Green Room, a parlor furnished in green and silver, and from there go into the famous Blue Room, where the President stands,

with his wife, and shakes hands with those who come to his evening receptions. The Blue Room is oval in shape. Its furniture is of wood decorated with gold leaf, and cushioned with satin fine enough for the dress of a queen.

Farther on is a room the walls of which are decorated with red silk velvet. This is the Red Room and beyond it is the state dining room, where the President gives his dinners to the highest officials and other famous people. This room

The President's Office.

is walled with oak, beautifully carved. The mounted heads of moose, buffalo, and bear, and others of the big game of America, look down upon us, and we are told that some of the animals to which they belonged were shot by President Roosevelt.

We are in the state dining room when a messenger tells us the President has consented to see us. His offices are

at the western end of the grounds, connected by a passage-way with the main body of the White House. We go with the messenger to the door of the President's office, and a moment later are standing in the presence of the Chief Executive of the United States. He rises and offers his hand, and we are somewhat surprised to find that he is not very different from other men we have known. He treats us kindly, and

The Capitol.

chats with us for a few moments about himself and his work.

Our President has much to do. He has a vast number of officials under him, both here and in all parts of the country; and he is kept busy from daylight to dark directing the affairs of the government. As we go out we hear the click, click, click of telegraph instruments, and are told that operators are kept in the White House to send out the President's orders to all parts of the United States.

Later on we are shown the Cabinet Room, where, three times a week, the President advises with the men who preside over the different departments of the government. Here he discusses with them a vast amount of perplexing business; and we learn that it is a great task to be the ruler of a nation and country so large as our own.

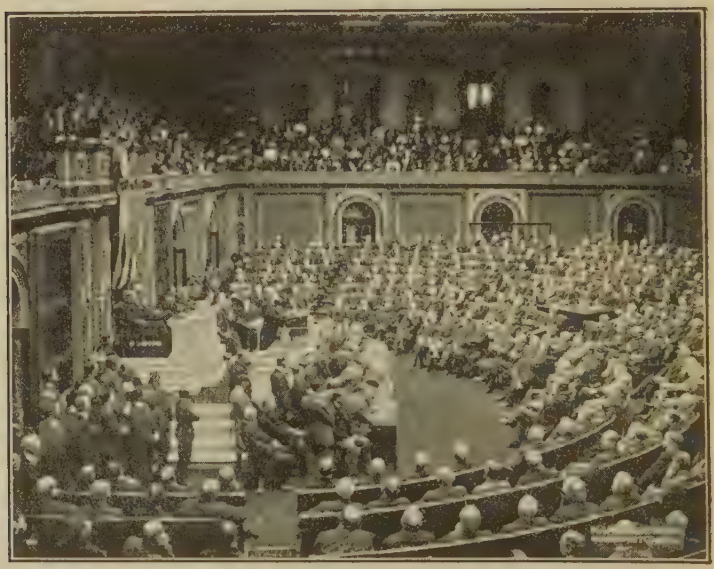
Now let us leave the White House and make our way down Pennsylvania Avenue to the National Capitol.

What a beautiful building it is! As we look up at it from the edge of the park which surrounds it, it appears like a huge marble palace with a great white dome floating, as it were, in the blue sky. Coming nearer, the building grows larger and larger, and we believe the guide when he says that it is not only one of the most beautiful, but also the largest, building of its kind ever erected. It covers three and one half acres of ground, and it has so many rooms that there are parts of it in which we might get lost and wander about a long time without finding our way out.

Entering the Capitol, we pass through halls swarming with people. It is a city in itself, the chief business of which is to make laws for our nation. The two great law-making bodies are at the opposite ends of the building. In the south wing is the hall of the House of Representatives, and in the north the chamber of the United States Senate, while a wide corridor runs across the building from the one to the other.

We enter at the House side, and, pushing our way through the crowd, soon find ourselves in the gallery of the biggest legislative room of the world. We are in the hall of the House of Representatives. The floor below us is so large that it could be divided into twenty-eight parlors, each sixteen feet square. The ceiling is so high above the floor that six of the tallest men might stand there one

on the head of the other, and if the stockings of the first rested upon the carpet, the hair of the sixth would just graze the ceiling. Below the ceiling, running all around the room, are banks of galleries which begin at the edge of a great central pit and slope upward to the walls.



"We can look down upon our representatives."

As we sit in the galleries, we can look down into this pit upon our representatives at work. Each has his own chair, the seats running around the room in the shape of a half-moon about a high platform at one side of the hall. Upon the platform is a marble pulpit, with the American eagle hanging out from the wall above it. That pulpit is the Speaker's desk, and the man who sits behind it is the Speaker of the House, who keeps order and says what shall be done. He has an ivory-headed mallet with which he

often pounds upon the desk, in order to make members stop talking.

But who are the little boys with the bright silver badges about the size of a half dollar on their coats, running to and fro with letters and papers in their hands? They do not seem to be more than twelve or fifteen years of age. Those are the pages. They run errands for the congressmen; and each receives two dollars and fifty cents a day for his work. When a congressman wants a page, he claps his hands, and the boys run to him from their seats on the steps of the Speaker's platform to get his orders. We shall find other boys doing the same work in the Senate.

A Page.

But what are the duties of our representatives? In connection with the Senate, they make the laws to govern this big country of ours. No national law can be enforced until a majority of both representatives and senators have voted for it and it has been approved by the President.

And how do they become congressmen?

The people of the United States choose the representatives. The states are divided into congressional districts, each containing about the same number of people. Every district has the right to one member of Congress, and its voters choose who he shall be.

And are the senators chosen in the same way?

No; not exactly. Every state has the right to two senators, little Rhode Island having just as many as Texas, which is more than two hundred times as big. Each senator is elected by the voters of a whole state.

Each senator and each representative gets a salary of

seven thousand five hundred dollars a year; but the representatives are elected for only two years, while the Senators are chosen for six. The representatives choose their own Speaker, or presiding officer; but the Vice President of the United States is the presiding officer of the Senate.

Let us now leave Congress and take a look at the Supreme Court. We push our way through the crowd about the doors of the House of Representatives, and pass on into a hall filled with the marble statues of some of the greatest men of our history.

We go through the rotunda, or circular room under the dome, and then on into the passageway which leads to the Senate chamber.

Here we are stopped by a messenger while a curious procession crosses the hall. It consists of nine men in long gowns of black silk. How dignified they seem, and how quiet every one is as they go by! Those are the Supreme Court justices. They are the heads of the judicial branch of our government, and are on their way to the court room.

Now they have passed, and we can go into the same room, though by another door. We enter just in time to hear the marshal of the court cry out: —

"Oyez! oyez! oyez! All persons having business before the honorable Supreme Court are admonished to draw near and give their attention. The court is now sitting. God save the United States and this honorable court!"

He sings this out in loud tones, running the words together into one sentence, and saying them all in a breath.

As he does so the justices are seating themselves behind a long mahogany table on a platform at the back of the room, their armchairs resting against columns of black-and-gray marble. The chief justice is in the center. His chair is under a purple canopy, out of which a golden

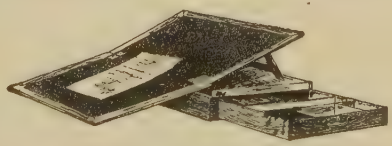
American eagle, holding in its beak a strip of metal, upon which are painted the words, "In God we trust," looks down with fierce eyes upon him.

The lawyers and others who have business before the Supreme Court are seated in a little inclosure below the bench. Back of them, against the wall, are the visitors, including ourselves.

It is usually quiet in the Supreme Court, for this is the most dignified branch of our government. It is so quiet to-day, in fact, that we feel like going to sleep after our hard day's sight-seeing. We are frightened as we catch ourselves nodding; and we rise, and slip gently out, and make our way back to our hotel.

4. THE DEPARTMENTS OF THE GOVERNMENT — STATE, WAR, NAVY, AND TREASURY

THIS is our last day in Washington, and there is so much more to be seen that we hardly know where to begin. We first visit the big granite building containing the State, War, and Navy Departments.



Jefferson's Desk.

The State Department has charge of the business between the United States and foreign nations. Its offices take up the south end of the building. Here all our treaties, or contracts with other nations, and our most important state papers, are carefully preserved.

In the library is kept the original Declaration of Independence, and also the little mahogany desk upon which Thomas Jefferson wrote it. The desk is so small that you could easily take it on your lap. It has little drawers for pens and writing materials; and, upon lifting the lid, we see pasted upon the under side a note in President Jef-

The State, War, and Navy Building.

ferson's own handwriting, stating that it was upon this desk that he penned that famous paper.

But who are those queer-looking people we see as we go through the halls?

They wear rich gowns of bright-colored silk, and their hair is in one long braid down their backs. They have yellow faces and queerly shaped eyes. They cannot be women, they are too large; and we have never seen men

like them before. They are the Chinese minister and two of his clerks. They have come to call upon the Secretary of State about some matter of dispute between their nation and ours. If we wait here, we may possibly see the German ambassador or the Russian ambassador come in. All the great nations of the world send men to our capital to attend to the business which their governments have with the United States; and our President sends his ambassadors and ministers to other capitals all over the world, and consuls or business agents to every great city.

"One of our great cruisers."

The Navy Department is in the side of the building which faces the White House. Here the Secretary of the Navy has his offices, and here his many clerks are at work. A country like ours must have war ships to defend it. There is always danger that some other nation may have trouble with us and may send gunboats to destroy our cities on the seacoast. For such reasons every great nation must have a navy. We know we are in the Navy Department by the models of war vessels which we see in the halls. The models are toy ships, in all their parts exactly like our men-

of-war, only hundreds of times less in size; by looking at them we can learn something about the real war vessels. and just how they work.

Here, for instance, is a model of one of our great cruisers. The model is so small that you could put it in a two-bushel basket; but the ship it represents is as long as a city block, and so wide that it would fill an ordinary street. The cruiser is made almost altogether of steel, and its outside is covered with steel plates several inches thick, in order that the balls fired at it may not go through it.

The guns of this cruiser are of many kinds. Some will send a shower of bullets at the enemy, hundreds of balls flying forth in a minute. It has cannon of several sizes; the largest of which are so big that it takes two bushels of powder to fire them, and so powerful that they will send shells of solid steel, weighing as much as three full-grown men, twelve miles at one shot. The war ships of other nations have similar guns, and hence you see why we must have steel-plated vessels to fight them.

A Modern Coast-defense Rifle.

There are many of these large cruisers and battleships in our navy. There are smaller war vessels, known as commerce destroyers, which can go very fast, and can capture the merchant ships of an enemy, or drive them from the seas. There are torpedo boats, which are very small war ships, and submarines, which travel below the surface of the water. Torpedo boats and submarines send out torpedoes under water to explode against the war ships of an enemy.

and sink them by making holes in their sides. These things show us how terrible war is and we should be glad if our country could always be at peace with other nations.

We feel this the more during our visit to the War Department, which has to do with the army. We must have soldiers upon land to defend us as well as ships upon the sea; and we also need troops in some parts of the United States to protect us from the Indians and to keep them in order. The United States has but a small number of soldiers in comparison with other nations. In times of peace only about one hundred thousand are required by our great country with its millions of people. We wonder at this, and ask one of the generals why the army is so small.

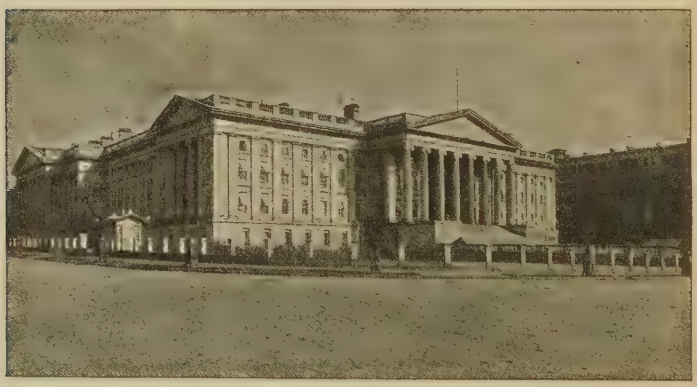
A Soldier.

He replies that numbers do not give any idea of the strength of the American nation. He tells us that every state has its militia, so that within a few hours one hundred thousand more men could be put under arms; and he says that the United States, in case of a war, has so many people that it could on short notice furnish about five million fighting men.

Passing down Pennsylvania Avenue, we visit the Treasury Department, which has to do with the money of the government. A vast sum is needed to pay the salaries of the employees, to carry the mails, and to perform other kinds of government work.

This money comes, in part, from a tax on the incomes of corporations and of people who have or make a great deal of money. More of it comes from the tariff on imports,

or taxes upon things from foreign lands which are brought into this country for sale. When ships arrive at any of our seaports they are examined by the customs officers of the Treasury Department, and upon certain kinds of goods a tariff, or tax, is collected. This tax is a stated amount for each yard, gallon, or pound of the material, or a certain percentage of the cost of the goods in the land from which they have been brought. This amount is usually added by the importers to the price asked for the goods, so



The Treasury Building.

that when we buy them it is ourselves who really pay the tax.

Other taxes come from certain goods manufactured in our own country. These are known as revenue taxes; and are collected only on spirituous liquors, such as whisky, brandy, and beer, and upon manufactures of tobacco for chewing, smoking, and snuffing. Such taxes must also be added to the cost of the articles taxed, and so the people who use them, and not the manufacturers, are really the persons who pay. In addition, the government gets

some money from its sales of public lands, from postage stamps, and from various other sources.

The money is sent to the Treasury Department to be kept until needed, and there is usually a vast amount on hand. We open our eyes wide when the guide takes us down into the vaults and shows us how millions of dollars' worth of gold and silver are stored there, being guarded day and night by watchmen. In other rooms we see piles of crisp new bank notes, and watch the hundreds of clerks who are handling old and new paper money.

Interior of the Treasury Vaults.

The Treasury Department makes all of our paper money. The money factory is in a large brick building which lies just beyond the Washington Monument. Let us visit it. We hear the rattle of the machinery as we enter the door, and the guide takes us through room after room in which, behind walls of iron latticework, scores of men and women are busy printing bank notes. The women wear aprons over their dresses, and the men have their shirt sleeves rolled up to their shoulders. The printing is dirty work, and every one in the press room is spotted with ink. In another place are the engravers, who with sharp tools are cutting out of steel fine pictures such as you see upon our bank

notes. In other rooms there are wonderful engraving machines.

How carefully everything is guarded! We meet watchmen everywhere, and there are steel vaults where the plates for making the bank notes are stored at night. Not one of the employees can leave the building until every note on hand has been counted and every sheet of paper and every printing plate is known to be in its place. This is to prevent counterfeiters from stealing the plates and paper and making money for themselves.

As we go through the Bureau of Engraving and Printing, we get some idea of the wealth of our nation by seeing the bank notes required for its business. Notes representing millions of dollars are printed here in a day. There are scores of women who do nothing else but count bank notes. How fast they work! Their fingers go like lightning. They do not move their lips, but they count the bills at the rate of a hundred a minute.

After being counted, the notes are put into a great steel box upon wheels and taken to the Treasury Department, from where they are shipped to all parts of the country. Our government never sends out a bank note a second time, and it is always ready to exchange new bills for old ones.

But what becomes of the old bank notes?

Come with me, and I will show you. All the old money received at the Treasury is destroyed. As soon as the bank notes come in, they are cut in halves and carried in a closed steel wagon to the basement of this money mill. We go down the stairs and watch the wagon unloaded. The cut notes are put into a big round iron pot, in which they are ground up by machinery and cooked and steamed until they become a pulpy mixture which looks like mush. Sometimes notes that were once worth more than two mil-

lion dollars form the grist for one grinding. Think of a pot of mush made of two million dollars in bank notes! Would you not like a good bowl of the meal before it is thrown into the kettle? There is, however, no chance to get at any of this money; and the government grinds it up in order to prevent any one from stealing the notes and using them as money again.

It is in the Bureau of Engraving and Printing that our postage stamps are made. The process is much the same as that of printing the bank notes, and the stamps are carefully watched that none may be lost. After printing, they are gummed by machinery. Then the little holes are cut around them by wheels, on somewhat the same principle as dough is cut in making animal crackers.

5. THE DEPARTMENTS OF THE GOVERNMENT — JUSTICE, POST OFFICE, INTERIOR, COMMERCE, LABOR, AND AGRICULTURE

LEAVING the Treasury, we visit the Department of Justice, where we call upon the Attorney General, or chief law officer of our government. It is important that all things connected with the administration of our public affairs should be done according to law; and the Attorney General, who is a trained lawyer, gives his advice to the President or to the heads of the other executive departments as to any questions of law that come up. The Attorney General appears before the Supreme Court in important government cases, and he has the superintendence of the United States attorneys and marshals in the different parts of our country.

From there we go to the Post Office Department to learn how our letters are carried over the United States and the world. The Postmaster General describes our vast postal system and shows us maps of the various mail routes, telling us there are so many in the Union that if they could be stretched out in one long line, they would reach to a distance twice as far as that from the earth to the moon.

Most of the mail is carried over the country on the railroads in cars made for the purpose. It is taken to the post offices of the cities and villages, where it is distributed, some of it going out to the farmers in the wagons of the rural free delivery messengers. In the cities the greater part is delivered at the doors of the houses by postmen on foot.

During our stay in this Department we go to the money-order division, where we are told that money orders to the amount of more than five hundred million dollars pass through our home mails every year and that tens of millions are thus sent from the United States to other parts of the globe. All the nations of the world have now combined in sending their mail, and for two cents one can send a post card anywhere around the earth, or for five cents a sealed letter to almost any place on it.

But what are those men and women doing in that office there at the side of the hall? They seem to be opening letters not addressed to them or to the government officers. We thought no one had the right to open another man's letter. But see! those clerks are reading the letters and putting them in new envelopes for mailing again! That is the dead-letter office. When a letter is so badly addressed that the postman cannot read the writing, or when he is unable to find the person to whom it is directed, that letter is called dead.

Such letters are forwarded to the Post Office Depart-

(45) Post Office Department, Washington, D.C.

ment, where the clerks open them, and, when possible, send them back to the writers. Thousands of dead letters are received here every day and millions of them in a year. We learn that some people are so careless about their money that notes and drafts to the amount of more than a million dollars are put into the mails every year in envelopes so badly addressed that they go to the dead-letter office. In some cases not even the signatures of the writers can be made out, and both money and letters are lost to their owners.

Leaving the Post Office Department, we visit the great marble buildings of the Interior Department. This department has to do with the public lands of the United States, with education, with patents, pensions, the Indians, and with various other matters.

In the Patent Office we are shown the drawings of many inventions made by Americans. Our people are very ingenious. We are told that they have produced more than two fifths of all the important inventions already discovered, and that often as many as twenty-five thousand patents are taken out in one year. The inventions are of every description, ranging in size from pills as small as the head of a pin to balloons as big as the Capitol dome, and in machinery from mechanical toys to steam engines.

When a thing is patented, for a certain time thereafter it belongs to the inventor, and he can charge what he pleases for the right to make it. Upon such rights have been built up our great manufacturing interests, employing many hundred thousand people and millions of dollars.

One of the lessons of the Patent Office is that we should not despise little things. Some petty inventions have made their owners rich. The patent for the rubber tip on the end of your pencil, for instance, was worth more

than one hundred thousand dollars to the man who first thought of it. The gimlet-pointed screw brought its inventor a vast sum, and the man who first put copper tips on the toes of children's shoes grew rich out of that idea. The inventor of the roller skate received many hundred thousands of dollars from his patent, and the different kinds of building blocks have made their inventors rich, while the man who patented the return ball with a rubber string attached to pull it back received a large income from it.

Our next visit is to the Department of Commerce. Its business is to foster and develop our foreign and domestic commerce as well as our mining, manufacturing, shipping, and fishery industries, and also the transportation facilities of the United States. It has charge of the Census Bureau, whose business it is to count our people every ten years, and to find out all about them, so that we can know just how many citizens we have and what they are doing. The Secretary tells us we are rapidly increasing in population every year and that we now number about one sixteenth of the whole human race. He shows us that we are the richest of all nations and are steadily growing in wealth. The largest part of the population are working people. To promote the welfare of the laborers there is a separate department, the Department of Labor.

We learn more about our great country in the Department of Agriculture. This has to do with the farms and their crops, as well as with our forests and other resources. The United States has so much rich soil that its products are worth more than those of any other country. The farms yield several billions of dollars' worth of grain every year, and the value of cotton is hundreds of millions. Our hay crop is so great that all the gold and silver mined in the world in a year would not be enough to buy it; and

the same is true of either our wheat or cotton, while each year's crop of corn is worth several times that amount. We find that we raise so much on our farms that we cannot use it all, and that hundreds of ships are kept busy carrying the surplus to Europe.

The Agricultural Department is always studying the needs of our farmers and planning to help them make their lands produce more. It has men traveling all over the world to find new seeds and new plants. It suggests new crops and methods of farming, and in many places shows how two blades of grass may be made to grow where only one grew before. We visit the Museum, where samples of cotton, flax, and other textiles are shown, and also of silk with the cocoons, silk worms and eggs.

We go into the greenhouses where oranges, lemons, and other luscious fruits are raised under glass, and later on visit a department filled with cases containing pineapples, persimmons, peaches, apples, and pears. These look so delicious that we feel like eating them, until we learn that they are made of wax and painted to represent fruits. We are shown nuts of various kinds, and specimens of other things which come from the farms, embracing the products of our various climates, from the tropics to the coldest parts of the temperate zone.

Before leaving the Department of Agriculture, we are advised to visit the Bureau which has charge of the forestry reserves of the United States. The officials tell us that we once had the most magnificent forests on the globe, one third of our whole country being covered with immense trees, where one could ride for days and days through nothing but woods. But the people did not realize what the trees were worth. They wanted the land for farms, and destroyed them in every possible way. They cut

many for lumber, and so wastefully that much of the best wood was lost. They chopped down the trees on the mountains, leaving some places so bare that no roots were left to hold back the water, and the rivers and streams became dry.

To-day there is comparatively little of the great forest lands left; and the Bureau of Forestry does what it can to encourage the people to plant new trees and to take care of their woods. It has also to do with the government forests and with the prevention of forest fires everywhere. We shall learn more about this as we travel through those parts of our country where the forests still stand.

6. BALTIMORE AND THE OYSTER BEDS

WE leave Washington this morning on our way to New York. The journey will take five hours on the cars, but as the country is thickly populated, and we shall pass several large cities, we shall stop on the way.

We take automobiles to the Union Station, which is not far from the Capitol. It is a white granite building covering almost six acres, and surrounded by beautiful grounds. We buy our tickets as we go through, and are soon in the train. We reach Baltimore in less than an hour.

Baltimore is the chief port of the Atlantic seaboard south of New York. It has a good harbor at the head of Chesapeake Bay, and is connected by many railways with the South and West. It is also near the coal fields of West Virginia and Pennsylvania, and therefore has great advantages for manufacturing and shipping. We find ocean steamers at the wharf, and see grain, flour, tobacco, and

other products taken from the cars and loaded upon ships to be carried to Europe, South America, the West Indies, and other parts of the world.

While visiting the harbor we hire a boat and have a look at Fort McHenry, whose bombardment by the British in 1814 caused Francis Scott Key to write "The Star-spangled Banner." You may remember the story. It was during the war of 1812, when the British fleet had attacked Fort McHenry, and Mr. Key, having gone out to one of the ships under a flag of truce, was detained there during the fighting. As he watched the firing throughout the night, his heart was sick with anxiety; for he could not tell whether the fort had fallen until the day broke. He then saw that the flag was still standing, and the inspiration of the song came to him. He wrote the first verses on the back of a letter before leaving the ship. As we look at the place, the words come to us and we sing: —

"O say, can you see, by the dawn's early light,
What so proudly we hailed at the twilight's last gleaming,
Whose broad stripes and bright stars through the perilous fight,
O'er the ramparts we watched, were so gallantly streaming?
And the rockets' red glare, the bombs bursting in air,
Gave proof through the night that our flag was still there:
O say, does that Star-spangled Banner yet wave
O'er the land of the free, and the home of the brave?"

It was in Baltimore that Randall wrote his song, "Maryland, My Maryland," and here Edgar Allan Poe began his career as a writer of poems and stories.

When Washington was laid out, Baltimore had already eight thousand people, and was considered one of the chief towns of the country. It now contains about three quarters of a million, and it has so many streets that if they were stretched out in one long line they would

reach almost from New York to Chicago. We visit the cathedral, the first one built in the United States, Druid Hill Park, and the Johns Hopkins University. Then we take a look at the monument which Baltimore has put up in honor of George Washington. It seems small in comparison with the huge structure we saw at the national capital.

The Cathedral at Baltimore.

We find ourselves quite hungry after our rapid tour through the city, and resolve to take a lunch at the station before we go on to Philadelphia.

What shall we eat?

We order oysters, for Baltimore is the chief oyster market of the United States. More than one third of all the oysters of the world are grown in the waters of Chesa-

peake Bay, and there are in Baltimore many thousand men and women who do nothing but take the oysters out of their shells in order that they may be shipped in tubs and cans to different parts of the country. We Americans eat more oysters than are eaten by the people of any other nation. The number we consume in a year is large enough to supply one dozen to every man, woman, and child on the globe, and still leave some to spare.

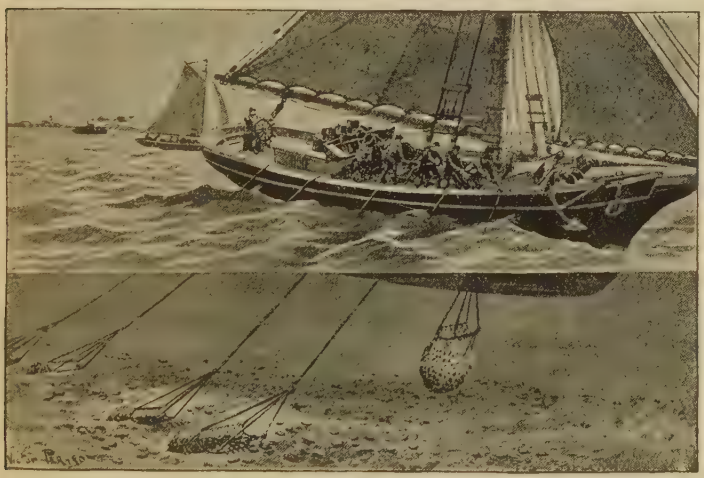
The oysters shipped from Baltimore are found in the shallow waters along the coast of Chesapeake Bay. They grow also in some other salt waters of the United States, but there are more good oysters in that bay than anywhere else. Most of the oysters grow of themselves; but there are also oyster farms. These are places in the bay or at the mouths of its rivers where the seed oysters are put, and shells thrown into the water, to which the young oysters can fasten themselves while they grow shells of their own.

Oysters grow in this way for four or five years before they are big enough to be eaten. Their eggs are so small that you cannot see them with the naked eye. It is said that one oyster will lay more than one million eggs in a season.

When an oyster is hatched, it is as small as the point of a fine needle. It looks like a white dot. It at once fastens itself to a piece of stone or shell or anything it can find which is hard. It soon gets to be as big as the head of a pin and so increases in size that when it is a year old it is as large as a silver twenty-five-cent piece. After that it grows about an inch a year for from four to six years, when it is full grown. One can tell how old an oyster is by the shell, the layers upon which show the number of years it has lived. The shells grow thicker and thicker year after year. Some have been found which were nine inches thick, and scientists claim there are oysters which have lived one hundred years.

The oysters are gathered during the fall and winter by men who sail in boats over the beds where they lie. The men have long rakes, which they push down into the water and thus drag up the oysters. Sometimes they use dredges, or great shovels worked by machinery, which scoop the shellfish from out of the bottom of the bay.

But here come our oysters. They are brought in on the half shell, and we see that there are two parts to an oyster



Oyster Dredging.

shell. One is hollow and the other is flat. In the hollow portion lies the liquor which is the life blood of the oyster. At the back of the shell we see the hinges by which the two parts are kept together.

What queer-looking things the oysters are as they lie here on the shells! They have mouths, but no heads. The mouth is in the narrowest portion of the body. It is merely a hole in the skin, for the oyster has neither tongue nor teeth. The mouth has four thin lips, and the oyster

gets its food by filtering the water which it takes into its mouth through them. It has no nose and no eyes; but scientists say that it will close up its shell if a shadow passes over the water above it. Hence it must have some way of knowing what is going on about it. The oyster has lungs and a heart. Its stomach is a little bag which lies just behind the mouth.

As we think of these things, we almost hesitate to let the oysters slip down our throats. We try one, however. The delicious taste takes away our scruples, and we find ourselves eating a second dozen before we are satisfied.

7. IN PHILADELPHIA — A VISIT TO THE MINT

A CAR ride of less than three hours brings us from Baltimore to Philadelphia. At Havre-de-Grace we cross the wide Susquehanna River where it flows into Chesapeake Bay, and a little later enter the state of Delaware, stopping to spend a short time at the manufacturing

city of Wilmington, near which General Washington fought the British in the Battle of Brandywine.

Long before we reach Philadelphia itself we see great factories, and realize that we are in one of our chief industrial centers. There are only two cities in our country which have more manufacturing establishments than Philadelphia, and they are New York and Chicago. There are several hundred thousand men and women here who make things to sell. Thousands are busy weaving cottons, woolens, and silks into cloths and carpets, and thousands are making shoes, hosiery, hats and caps, and other clothing. There are thousands engaged in shipbuilding and in making cars and carriages. Our greatest war vessels are built here and many of our railroad locomotives. There are others who are doing work in iron and steel, and in manufacturing leather. Some are making chemicals, including drugs and medicines, and others are employed in printing and bookbinding.

William Penn.

As we proceed with our tour over the United States, we shall see more factories, and shall learn that we have now become the chief manufacturing nation of the world. When our country was first settled, most of the people were farmers. They raised things from the soil. As more came, some began to make things to sell. This has gone on until now a large percentage of our population is engaged in manufacturing. We have more than twelve times as many factories as we had forty years ago, and hundreds of millions of dollars are earned every year by those who work in them. If we could see all the workingmen of the world, we should perceive that our people are better fed,

better clothed, and better housed than those of any other nation. We find this especially so in Philadelphia. We walk for miles through long streets of small, neat houses made of red brick, with steps of white marble. There are thousands of such houses here belonging to the working people, and it is said that more persons own their own homes in Philadelphia than anywhere else.

Why has Philadelphia become a great manufacturing city?

One reason is because it is so situated that materials can be cheaply brought to it and the manufactured goods shipped from it to other parts of the United States. The slopes of the Appalachian range are such that railroads have been built from Philadelphia through the passes of the Allegheny Mountains, thus giving it an easy road to the lands farther west. It is also a seaport, although it is almost one hundred miles from the Atlantic Ocean. Large steamships can sail up Delaware Bay and on to Philadelphia, bringing the materials the people want to use in their shops, and carrying their manufactures to all parts of the world. The Schuylkill and Delaware rivers, which here come together, furnish Philadelphia with thirty miles of water front for docks and wharves. They also give water power for manufacturing purposes, and the city lies so near the coal lands of Pennsylvania that the fuel for steam and electric power costs but little. Moreover, not far away are some of the largest beds of anthracite coal to be found anywhere. This coal makes a great heat and is valuable for manufacturing; it is also used largely as the fuel which heats our homes. Anthracite is so hard that people for a long time did not think it would burn, one noted man saying that, if the world were burned up, this would be the very last thing to catch fire.

Philadelphia is one of the oldest cities of our country, and for ten years, from 1790 to 1800, it was the capital of the United States. It was founded by the Quakers under William Penn, and for this reason it is often called the Quaker City. It was here that the Continental Congress met, and here the Constitution of the United States was drawn up and our Declaration of Independence signed. Our first President had his office in Philadelphia, and here Congress assembled until 1797.

Independence Hall.

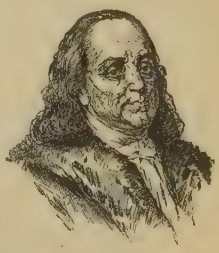
We visit Independence Hall, where the Declaration of Independence was adopted; and then go to Carpenters' Hall, where the first Colonial Congress assembled. We walk around the city hall, an enormous structure of granite and marble covering more than four acres. It has a tall tower upon which stands a bronze figure of William Penn, made by Philadelphia workmen. It is one of the largest statues in the world. It does not seem big as we look at it from the ground, but it is really as tall as a three-story house, and the buttons on the coat are as large around as a tea plate.

During our tour of the city we tarry a moment at the grave of Benjamin Franklin. It is in the yard of Christ Church, in the midst of the hum and hurry of the busy

city, marked only by a plain marble slab. It was in Philadelphia that Benjamin Franklin lived the greater

City Hall, Philadelphia.

part of his life. He was born in Boston, and learned there the trade of a printer. He was only a boy when he came to Philadelphia to find work, and his first meal here was a loaf of bread which he bought and ate as he walked through the streets. He afterwards became a great man and was of much service to the United States.

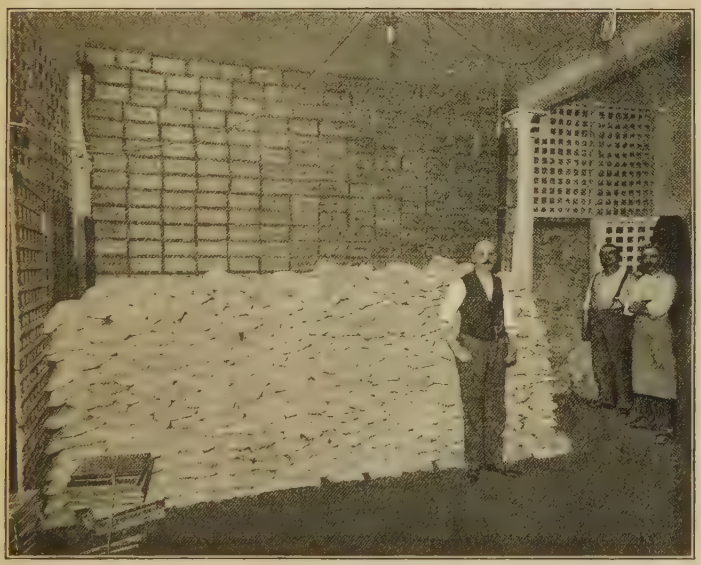


Benjamin Franklin.

When Franklin first came to Philadelphia, it was larger than New York, and it remained so until the Erie Canal was built. After that New York got ahead, but Philadel-

phia continued to be the second city of the United States for many years, and it is now surpassed in size only by New York and Chicago. It has more than fifteen hundred thousand people.

We visit the mint, where most of our gold, silver, and copper money is made. There are several other mints in



Interior of Money Vaults, Philadelphia Mint.

the United States, but the Philadelphia mint is the oldest. It was founded during the presidency of George Washington, and it coins millions of dollars' worth of gold and silver every year. It is situated in the heart of Philadelphia, not far from the city hall. There are guards at the door, and visitors are carefully watched as they are taken from room to room and shown the processes of coining money.

The superintendent of the mint goes with us. He leads us down into the vaults and shows us where the gold and silver metal and coin are stored away. In one vault we see millions of silver dollars tied up in bags and stacked up against the wall like so much corn. In a smaller room we are shown piles of gold bricks. They are laid up in regular order in different parts of the vault. They are of about the size of a cake of kitchen soap, and do not look heavy.

The superintendent asks us to lift one of them, and we find our backs almost broken by the effort. It weighs forty pounds, or as much as many a six-year-old boy. In other vaults we are shown quantities of silver bullion, the bricks of which are larger and heavier, and learn that from these gold and silver bricks our money is made.

We next enter a room where men are melting gold, and here see how copper and other metals are put with it into the melting pot, in order that the money may be harder and wear better. The gold we saw in the bricks was so soft that we could scratch it with our finger nails. It was pure gold, and the superintendent tells us that coins made of pure gold would soon wear away, and that a pure gold wedding ring would hardly outlast the honeymoon.

The gold bricks, having been melted, are cast into ingots or long gold wedges, about as wide as a twenty-dollar gold piece, and a little more than a foot long and two inches thick. It is from them that the gold coins are made.

As we go on into the silver-melting room we observe that the metal for the silver dollars is cast into strips of the same kind. We see a man wheeling a box of these silver ingots out of the room, and follow him along the hall to learn how the ingots are made into dollars. Many have

the idea that our coins are cast; the gold and silver being melted and turned into molds just as in the making of bullets, save that, when the molds are opened, out drop gold eagles and silver dollars instead of balls of lead.

We soon find, however, that our coins are stamped out of the cold metal, and that machines with an enormous pressure put upon their faces the beautiful images of the goddess of liberty and the American eagle. The silver ingots are first rolled between cylinders of steel so graduated that the ingots grow thinner and thinner as they are pulled through them, until at last they are just a little wider and about as thick as a silver dollar. They have been so drawn out by the process that they are like long bands of hoop iron rather than like chisels or wedges. These bands or strips are now run under a vertical steel punch which cuts out of them round pieces of silver of just the size of a dollar. These are the blanks of which the dollars are to be made.

A Coining Machine.

It is important that every coin should have the right amount of silver in it, so each blank is weighed before it is stamped. After weighing, it is taken down into the basement of the mint; and, with thousands of other blanks, is

shoveled into a vat of acid, which eats off the dirt. It is then dried and taken upstairs to be coined.

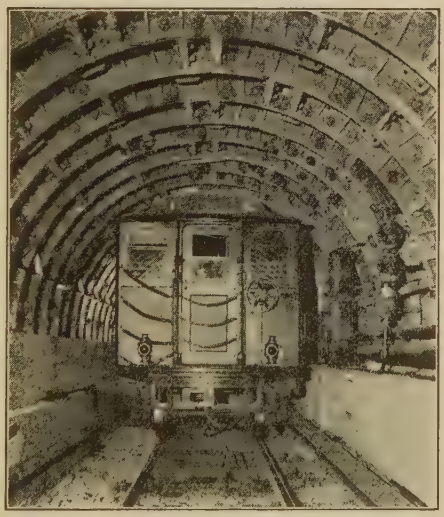
The coining is done by the coining machine. The silver blanks are fed into it through a long tube which drops them between two dies. The upper die bears the picture of the goddess of liberty, and the lower that of the American eagle as well as the lettering which you find on the silver dollar. As the coin lies there, the two dies come together upon it, exerting an enormous pressure, and stamping the beautiful impressions which you see on our silver money.

Gold coins are made in the same way, and likewise the cents which are manufactured by thousands. The total value of the gold pieces coined in this mint from 1793 to 1910, is more than one thousand million dollars, and that of the silver pieces is hundreds of millions. Shortly after we took possession of the Philippines, eighty-six million coins for those islands were made here.

Leaving the mint, we go to Franklin Field, the athletic grounds of the Pennsylvania University, to watch the boys play football, and thence on to the Zoölogical Garden, which is free to all school children. We visit Girard College, which was founded by a rich man for the education of poor orphan boys; and then, after a meal at the railroad station at Broad Street, we take the train for New York.

8. NEW YORK AND SOME OF ITS WONDERS

IN coming from Philadelphia to New York, the train takes us through Trenton, the capital of New Jersey, famous for its pottery manufactures. We go past Princeton, near where General Washington defeated the British in 1777 and where he wrote his farewell address to the army, then through Newark on the Passaic, noted for its manufactures of jewelry, leather, and iron, and on to the banks of the Hudson River. Here our train shoots into a tunnel far down under the bed of the stream, and we come out in the busiest part of New York. There are other tunnels in New York, and we might go underground to almost any part of the city, or even cross below the East River and come out in Brooklyn. These tunnels are really semicircular steel tubes with flat bottoms so set in beds of cement that the water cannot seep through. They are lighted and ventilated by electricity, and the cars are moved by the same motive power.



"Our train shoots through a tunnel."

We are now in the biggest city of our hemisphere. New

York has more than five million people, and with the exception of London, it is the largest city on the globe. We find it difficult to realize how big it is. It grows upon us at every step as we travel through it. We ask for a hotel, and hardly know which to choose when we learn that New York has so many that we could lodge in a different place every night for three years without going outside the city. More than a thousand passenger trains arrive or leave every day.

The traffic of New York is so great that it requires roads both above and below ground, and, as we shall see farther on elevated railroads upon which the cars fly through the air over tracks supported on posts. The business sections are so crowded with wagons, drays, carts, and automobiles of various kinds that we have to ask the policeman to help us from one side of the street to the other. We see the police everywhere. They are dressed in blue uniforms, with silver badges on the breasts of their coats. With a motion of their hands to the drivers they hold back the traffic. We learn that it takes ten thousand such men to keep order here.

A New York Policeman.

At first we determine to see the whole city, but find that it has so many streets that if we should walk eight miles every day we could not go through them all in one year, and we give up the plan in despair.

But before we go on, let us try for a moment to think just where New York is; for it is its situation that has made it so great. The city lies, for the main part, on the island of Manhattan, at the mouth of the Hudson River,

which here flows into the Atlantic. It also includes the Bronx on the mainland to the north, Staten Island, and the boroughs of Queens and Brooklyn on Long Island, all of which have a water front on the rivers or on New York Bay, forming one of the largest and best harbors of the world.

From this harbor run the easiest and cheapest routes from the Atlantic Ocean to the interior of our country. They make their way inland through the Mohawk and Hudson valleys, where the land is low and the slope over the Appalachian Highlands so slight that freight has to be lifted much less than upon the routes over the mountains farther south. Therefore the railroads starting at New York and going through these valleys can carry goods from the East and from Europe more cheaply to the interior of our country than those from other seaports.

Moreover, New York is connected with the Great Lakes by the Hudson River and the Erie Canal, so that the vast farming and manufacturing regions lying about and beyond those lakes can send their products by water to New York for shipment to Europe, and by the same means can have cheap goods in return. There are also iron and coal fields within easy access of New York, and the raw materials for many manufactures can be had at low cost.

The island of Manhattan is not quite fourteen miles long; it is so narrow that you could walk from one side of it to the other at almost any point in less than an hour. Its form makes one think of a poorly laid out baseball ground. It is in the shape of an irregular diamond, squeezed in between two rivers, its lowermost point extending out into New York Bay.

We begin our explorations at the lower part of the island. The ground here is so valuable that it is safe to

say that all the gold mines on the globe could not in one year produce enough money to buy it. When our forefathers came it belonged to the Indians.

Now what do you think the Indians got for it?

They sold it for stuff worth about twenty-four dollars. They did not think it of any value, for it was hard to get at it with their little canoes. So when some men from Holland came to America and built a fort here, not quite three hundred years ago, they found the Indians not unwilling to sell. The savages had not yet learned what money meant, and they took their pay in beads, buttons, and other small trinkets.

These Dutchmen, as the people of Holland are called, built a little town upon the island and named it New Amsterdam. It was so known until the place was taken by the English, when it was renamed New York. It rapidly grew, and was already the second city of the United States at the time the Declaration of Independence was signed. It increased still faster after the Erie Canal was opened, and soon became our chief American city. It is now by far the largest city on our hemisphere, and in the course of time will surpass London and be the largest of the whole world.

We spend some time on Broadway, the chief business street of New York and the main artery into which the other streets flow. How lively it is and how noisy! Every one is on the rush, and as we join the hurrying crowd we are jostled and pushed this way and that. The sidewalks are black with men, women, and children, moving along, paying little attention to any one but themselves. The roadways are blocked with cars and wagons, the drivers of which are scolding at one another. There are automobiles and motor trucks, puffing and smoking.

(67) "We walk up Broadway."

How high the buildings are! They are so tall that we could not shoot an arrow up to their roofs. They are twenty, thirty, and even forty and more stories high, so that we seem to be walking through great canyons which shut out all but one strip of sky overhead.

These big office buildings are beehives of humanity. Many of them have more people than a large country village. They are furnished like palaces. We walk through them over floors of marble, and fly on elevators from story to story. Some have post offices in them. They have rooms for bootblacks and barbers, and many have restaurants in the top story where we sit at lunch higher up than the spires of the tallest church steeples.

Everything is business in this part of New York. Upon all sides of us are great wholesale establishments. There are retail stores everywhere. As we go through the side streets we observe that thousands are working in cellars, making all kinds of goods under the ground.

Trinity Church.

We walk up Broadway past the City Hall Park, about which some of the big newspaper buildings stand, and then turn and go back a few blocks down the street until we come to Trinity Church, one of the oldest and most interesting buildings of the United States. It is made of brownstone, and there is a

large churchyard about it, in which are the tombstones of some famous Americans of the past. The churchyard is a beautiful place filled with flowers and trees, and it seems strangely peaceful in contrast with the pushing throng on Broadway.

We enter, and stand for a moment by the tomb of Robert Fulton. He was the man who made the Clermont, the first steamboat that sailed on the Hudson River. The Clermont made its trial trip from New York to Albany in 1807. Its voyage proved that steam could move vessels through the water, so that Robert Fulton may be called the father of the thousands of steamships which come to New York every year.

Near him in the yard of old Trinity lies Capt. James Lawrence, the hero of the frigate Chesapeake, whose famous "Don't give up the Ship" immortalized his memory; and at the lower end near the fence we see the white marble monument under which are the remains of Alexander Hamilton, one of the founders of our government, who was shot by Aaron Burr in a duel.

Leaving the churchyard and crossing Broadway, we take a walk through some of the most wonderful streets of the world. We are in the Wall Street section, surrounded by the offices of the men who own or control much of the wealth of the United States.

Wall Street is often called the money capital of our country. Near it, on Broad Street, is the Stock Exchange, where railroad and other stocks and bonds to the amount of billions of dollars are bought and sold every year. By stocks are meant shares in different business enterprises such as railroads, steamships, telegraphs, and telephone. The prices of such shares for many reasons sometimes change quickly, and men make and lose fortunes in buying

and selling them. It is in the Stock Exchange that such business is done.

We are admitted to the gallery of the building, and look down upon a most curious sight. In the great room below us there are hundreds of well-dressed men, some with hats on and some without, running to and fro, pulling and yelling at one another. They are the bankers and brokers who are the members of the exchange. It costs each of them upwards of seventy thousand dollars for the privilege of buying and selling. Each has a little notebook in one hand and a pencil in the other, and with these he jots down his purchases and sales. Telegraph boys rush in and out through the crowd, and the sight makes us think of a lot of madmen rather than sensible people.

Wall Street.

Near by we find the Produce Exchange, where grain of all kinds is bought and sold. New York is one of the chief grain markets of the world, and in this exchange wheat, corn, and oats are sold not by the single bushel, but by the thousands of bushels. The smallest amount one

can buy or sell is five thousand bushels, and millions of bushels are often bought in one day. We next visit the Cotton Exchange, where men trade in cotton in large quantities; and our heads fairly swim as we try to understand the vast sums which it takes to manage the business of this one city of our country.

We are anxious to get out of the bustle, and we walk down a side street to rest our eyes and ears before taking a Broadway car to the hotel farther uptown where we shall stay over night.

9. OUR FOREIGN COMMERCE

THE largest hotels of New York are in the middle of the island of Manhattan, several miles above the place where Wall Street runs into Broadway. That in which we stay is not far from Herald Square, and when we start out in the morning we are in the heart of one of the great shopping districts. Broadway is here almost as busy as down at Trinity Church, and the side streets leading to it are so lined with store windows that walking along them is like going through a huge museum walled with glass cases.

Goods of all kinds are spread out before us, and we see that every nation of the world has sent its products to New York for sale. Those bright-colored silks over there came from China. They were woven on rude looms by yellow-skinned, slant-eyed men and women upon the banks of the Yangtze Kiang. They were brought to America on a steamship through the Indian Ocean, by way of the Red Sea and the Suez Canal. They crossed the Mediter-

ranean, passed through the Strait of Gibraltar, and thence came to New York. Those rich velvets and laces were brought across the Atlantic Ocean from Europe; and those diamonds which you see in that jewelry store were dug by black-skinned, half-naked men in the mines of South Africa.

Hotel Waldorf-Astoria, New York.

Here is a tea store which is supplied by the bushes of the Himalaya Mountains in northern India and by those of the tea gardens of Japan and China. Next to it is a shop where one can buy coffee from Brazil and sugar from Cuba. That toy store has many French dolls, and curious mechanical playthings made in the mountains of Germany; and the tiger-skin rug in the window next door once covered the body of a beast that prowled through the jungles of northern Hindustan. There are other things all about us from every part of the world, and we resolve to go to the wharves and see the great ships which bring these things into our country.

Let us first take a ride to the lower part of the island. New York is so crowded that the surface electric cars require a long time to make their way from one end of it to the other. To perform the journey more quickly

subways have been dug under the streets, in which fast trains run, and elevated railroads have been built high above the roadways. Upon the latter the cars go almost as rapidly as an ordinary railway express. These elevated tracks are supported by steel columns which extend to the height of the second or third story windows.

We have to walk upstairs to get to the train, and we find ticket offices and news stands on the elevated platforms.

A Subway Station.

Our tickets cost us five cents apiece. We drop them into the box at the door of the station, and rush for the cars. As we step aboard, the guard closes the iron gates at the side of the car platform, and the train begins to move.

The cars have windows like those of a street car, and we can see into the upper stories of the houses as we ride through the air. Here women are washing clothes, there they are cooking ; here we go by a shop where tailors are working, and there pass buildings given up to manufacturing.

New York has more factories than any other American city. It has more than a half million people making things to sell, the different kinds of industries numbering over one thousand. The capital used is about one billion and a half dollars and the product so great that if every family in the United States should give one hundred dollars it would hardly pay for all the goods New York makes in one year.

Elevated Railroad on the Bowery, New York.

Here we are at the wharves. What a crush and jam there is all about us! The streets are crowded with wagons, carts, trucks, and motor vehicles loaded with goods on their way to the boats. We walk for miles past great docks upon which are long, roomy sheds filled with bales, boxes, and barrels where scores of men are at work loading and unloading vessels.

New York has twenty-five miles of water front on Manhattan Island alone, many other wharves and landing places on the Long Island and New Jersey shores. More than half of all that we buy of foreign nations and about three fifths of all that we sell to them pass through here.

Our imports, with the exception of a few things that cannot well be raised in America, consist almost altogether

Wharves, East Shore of Manhattan.

of manufactured articles. We are the chief manufacturing nation of the world, but our factories are not yet numerous enough to supply all our needs, and so we import much from other countries. The amount of money we spend in this way is so great that if it were divided among all of our people, every man, woman, and child of

us would get ten dollars' worth each year, and there would be many millions to spare.

Moreover, we often sell to other countries goods worth many hundred million dollars more than the merchandise we buy of them, so that it takes a vast fleet of vessels to carry our goods abroad and to bring foreign goods back to us. Over three thousand steamships annually come from foreign countries to the wharves of New York, and there are in addition thousands of sailing vessels. A procession of steamers is always moving back and forth across the Atlantic Ocean carrying our wares to the people of Europe and bringing their wares to us.

A large part of all that we sell abroad is produced on our farms. We raise so much more than we can use that the United States has become a great country store for the European nations. Every year hundreds of ships laden with grain sail out of New York. The steamers have their holds filled with grain in bulk, and between the decks the wheat is piled up in bags. Such vessels are loaded quickly, half a million bushels of grain being often packed away in a ship in one hour. Vast quantities of other provisions are sent abroad every week, and hundreds of million dollars worth of our manufactures are carried across the Atlantic for sale. Ships are also loading for the West Indies and South America. Some are starting out for the Panama Canal and others are taking on cargoes for East Africa and Asia by way of Gibraltar and the Suez Canal.

The people of many far-away countries send to our great store for a part of the oil they need for their lamps. Our petroleum is carried over all the oceans. It is shipped from New York, Baltimore, Philadelphia, and other places, in tank steamers, a single one of which will hold as much as thirty thousand barrels of oil. The steamer is divided

into a half-dozen or more huge tanks. The oil is pumped into the tanks, and it remains there in bulk until it is again pumped out upon the wharves of the great ports of Europe, Asia, and Africa.

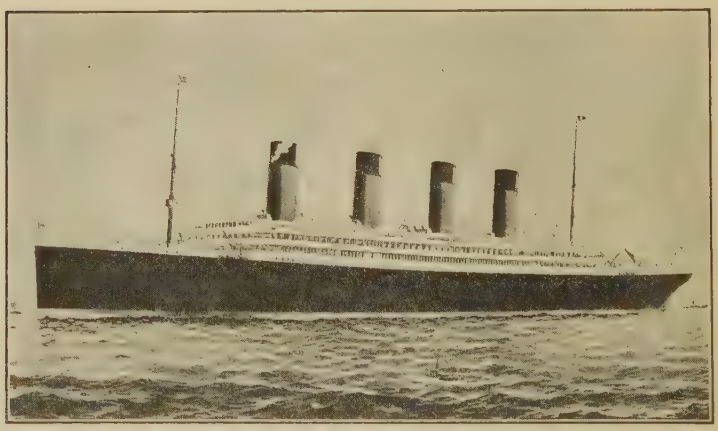
It is in vessels of the same kind that molasses is brought to the United States from Cuba. Think of the biggest house you have ever seen as one solid box, and let it be filled with molasses, and you may get some idea of the sweetness that, protected only by a thin sheet of steel, is thus carried through the salt waters of the ocean.

While at the wharves we visit ships loaded with cotton. This comes from the plantations of our southern states and is carried in bales to Europe and Asia to be made into cloth. We get more than twice as much every year from the raw cotton we sell to other countries as from our sales of wheat and flour. Cotton is, in fact, one of the most valuable of all the articles which the rest of the world buys from our store. We sell more than half of all we produce, and we sometimes get as much as four hundred million dollars for cotton from Europe in one year. We sell also great quantities of manufactures of various kinds, and such exports increase every year.

Our chief trade is with Europe, but we are annually sending more and more to Asia, South America, Australia, and Africa, and to our cousins of the Hawaiian and Philippine Islands. The English are our best customers. They buy a vast deal of our raw cotton, breadstuffs, and manufactured articles, for which they pay several times as much as we pay for the various kinds of goods they sell to us.

The fastest steamers of the world are those which go from New York to England. Some vessels now cross the Atlantic in less than five days, traveling so swiftly that they have been called ocean greyhounds. We visit one of

these steamers which has just come from Liverpool, and is now docked alongside of a great pier in the lower part of Manhattan Island. It is a great floating house of a half-dozen stories, so long that it would reach from end to end of the average city block, filling the street and extending high over most of the houses. It has large dining rooms, sitting



An Ocean Greyhound — *Olympic.*

rooms, bedrooms, and bathrooms, and we see that people can now live quite as well upon the water as upon the land. We look at the enormous engines, as strong as forty thousand horses, which drive the huge ship through the water, and are surprised when we are told that its furnaces use up every day as much coal as would furnish heat for fifty large dwelling houses for a whole year.

Away down in the lower part of the ship we find some large rooms not so well furnished. This is the steerage. It is full of poor people who have come across the Atlantic from Europe. Such people are not landed at this

wharf. They will be carried to an island in the harbor where the government officers of the Immigration Bureau will examine them to know whether they are likely to make good citizens of the United States. We are glad to have people from all parts of the world to settle in our country and aid in developing it; but we do not wish any who are diseased or who are unable to work and hence likely to go into the poorhouses to live. Therefore our government has provided that all immigrants coming to this country must be examined before they can land. If they have no money at all, or are idiots, insane, or diseased, or have been convicted of stealing or certain other crimes, they are sent back to the countries whence they came. Otherwise they are permitted to stay.

For years the poor people from all parts of Europe have been coming to America, because they can make more money and live better here than at home. Since 1820 it is estimated that almost thirty million immigrants have arrived on our shores, and in 1910 almost one half of our inhabitants were either born in other countries or were the children of people born there.

We visit the place where these immigrants land. Here we find ourselves surrounded by hundreds of odd-looking men, women, and children. Very few of the women wear bonnets, and the men have caps or queerly shaped hats. There are many English and Irish, and a large number of Germans. There are dark-faced Italians, and long-bearded Jews from Russia and Poland. There are people from Norway and Sweden, and boys and girls from Holland, who wear wooden shoes. Every person has his baggage with him, and some sit on piles of bedding which they have brought from their homes. They seem strangely out of place; but as we look at them we realize that they

(80) "Two little immigrants."

are strong and able to work, and that most of them will be good American citizens.

We take a boat and sail over to Bedloes Island to see the magnificent statue of Liberty Enlightening the World. This statue is intended to show every one who comes into New York that this is a country where the people rule themselves and where all can learn to be free. The statue is as high as a tall church steeple. We get some idea of its size when we learn that forty men have stood inside its head at one time, and that its forefinger is so long that it would reach from the floor to the ceiling of an average room, and so big around that the hoop of a flour barrel would just about fit it if used as a ring.

Liberty Enlightening the World.

As we leave the statue and go back to New York we have a fine view of the Brooklyn Bridge, the oldest of the bridges which unite that part of New York known as Brooklyn with Manhattan Island. It is an immense structure of stone and steel, more than a mile in length, crossing the waterway called East River. The bridge cost more than the Capitol at Washington, and one of the most interesting things about it is the story of how it was built. It was designed by John A. Roebling, who died before it was begun. His son took up the work, and after thirteen years it was completed. The young man labored so hard in superintending its building that he broke down in health, and the doctors refused to permit him to go out of the house. This was after he had worked only

three years. Still he superintended the construction to the end.

He took a house on Columbia Heights, not far from the bridge, with windows looking out upon it. Here from his sick room with a telescope he watched the workmen day by day and hour by hour for ten years, sending his orders as to

The Brooklyn Bridge.

just how everything should be done, and managing the construction almost as well as though he had been on the spot.

We close our day by riding from Washington Square up Fifth Avenue, on the top of a motor bus, to Central Park, the great playground for the boys and girls of New York. The Park is full of interesting things, and is one of the finest and most famous pleasure grounds of the world. Prospect Park, on the Brooklyn side of East

River, is another delightful place, but we cannot visit it now. After another restful night at our hotel, we take

A View in Central Park.

electric cabs for the Grand Central Railroad Station, where we start for New England in a train drawn by two electric locomotives.

10. NEW ENGLAND — COMMERCE AND MANUFACTURES

NEW ENGLAND is the name often used for the northeastern portion of the United States, comprising Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, six of the smallest states of our Union. It is the southern part of the great peninsula, which, including Nova Scotia, New Brunswick, and a part of lower Canada, is formed by the Atlantic

Ocean, the St. Lawrence River, Lake Ontario, and the Hudson. Many people believe that this was the first part of America to be discovered by Europeans, and that Leif Ericson, a Norseman, sailed along its coast as early as one thousand A.D. Some years after Columbus found the New World its shores were visited by other explorers, and in 1614, Captain John Smith having sailed along them made a rough map of the coast and gave the region the name of New England. Before that it had been called North Virginia, and it was under that title that some of it was granted to the Plymouth Company, which made the first settlement.

The soil of New England is such that many of its people can make more money in other ways than by farming. A large part of the land is mountainous. The Appalachian Highlands pass through it, and the only very fertile spots are to be found in the valleys of the rivers, and in the narrow strip of Atlantic plain which runs around the coast. Much of Maine is covered with forests and lakes, and some of the land in other New England states is so stony that it can be used only for the rearing of cattle and sheep. More than half the food consumed in this part of our country comes from the Mississippi Valley. The New England winters are long and cold, and the ground is often covered with snow for months at a time.

You might think that this would be one of the poorest parts of the United States, that few people could live here, and that those who manage to exist would have very little money indeed.

Now the truth is, New England has vast wealth and a great population. The southern portion of it is the most thickly settled part of our country. There is no other

state which has so many inhabitants in proportion to its size as Rhode Island. Connecticut and Massachusetts have hundreds of cities and villages. There are few places in the world where men live so well. The New Englanders have more money than the people of any other section of the same size in the United States; and Massachusetts alone has enough wealth to buy some of the western states that are ten times larger.

How does this come to pass? New England has no great gold, silver, or iron mines, and it has no large coal fields like those of Pennsylvania.

The secret lies in manufacture and commerce. The steep mountains which seem so poor to us are one of the great sources of the riches of New England. They lie near the sea and have many small rivers and streams flowing rapidly down them, which give water power just at the places where ships can most cheaply bring the materials for manufacturing, and from where the goods made can be easily sent to all parts of the world. This has led men to build factories along these streams.

Water power is the cheapest of all power. It is used to generate electricity; and a great part of our manufacturing is done by it. One little stream will often do the work of an hundred horses, and indeed, it is estimated that we have so much power of this kind in the United States that if we used the whole of it, it would be stronger than several hundred million horses all pulling at once.

The people of New England learned very early that it was hard to get a living from the soil. They then began to manufacture for others, and soon found they could earn more money in that way than by farming. They became so skillful that they could make goods cheaply and well. As our country grew they built more and more

factories. They found they could bring in coal from Pennsylvania at slight cost, and now in most parts of New England there are factories moved by steam, in addition to those run by water.

It is wonderful how many things are made in New England. Nearly every one of us has now upon him one

Interior of a Cotton Factory.

or more of its products. Many kinds of cotton goods come from its factories, and we may visit huge mills which are weaving ginghams, muslins, calicoes, and other dress goods out of the woolly fiber of the plants from our southern states. In other places they are making sheets, towels, and handkerchiefs, as well as string and thread and underwear of various kinds. The cotton in great bales of five hundred pounds each is brought upon ships from Galveston, New Orleans, and other parts of the South. By machinery it is spun into thread and woven into cloth.

The enormous water power of the Merrimac and other

rivers applied to such weaving and other manufacturing has built up great cities, such as Nashua and Manchester in New Hampshire; Fall River, New Bedford, Lowell, and Lawrence in Massachusetts; and Pawtucket and Providence in Rhode Island. These cities are largely devoted to making cottons. Fall River and New Bedford make more cotton cloth than any other places in the United States. They weave so much every year that if it could be joined into one strip a yard wide, it would reach from Boston to San Francisco and back. There are also many cotton mills in the South, and we are told that huge factories have been established close to the plantations upon which the cotton is grown.

A large part of the woolen goods of the United States is made in New England. The first woolen mill of America was started in Hartford, Connecticut, in 1788; and when George Washington was inaugurated President, in 1789, he wore a suit made of cloth woven in that mill.

So many of our boots and shoes are manufactured in Massachusetts that tens of millions of the people of the United States may be said to have a part of that state under their feet. Connecticut not only tells us when to get up in the morning, for it makes the most of our clocks, but it also helps us to dress, for its factories produce tons of buttons, millions upon millions of hooks and eyes, and the most of the pins which fasten our clothes.

In Massachusetts are some of the biggest paper mills of this country. There are large factories in Rhode Island which make beautiful jewelry, and in Connecticut are many places where knives, nails, and all kinds of hardware are manufactured.

It is in this region that we find out all about watches. In southern New England are hundreds of men and

women working on timepieces, the simplest of which have only fifty-four parts, and the more expensive ones several times that number. We can learn a lesson in being exact by noticing the care with which every part has to be made. In the finer watches there are steel screws so small that they look like grains of sand. It would take three hundred thousand of them to weigh a pound.

As we go through the factories we see that, after all, steam and water do only a small part of the work. It requires many men and women to run the machines and to do certain other kinds of labor. Some parts of a watch are so small that it costs more than ten thousand dollars in wages to turn a pound of steel into them. We are shown hair springs which require so much labor that it is said that seventy-five cents' worth of iron ore, after being made into them, is worth four hundred thousand dollars. Of this less than one dollar would be for the ore, and most of the remainder would be paid to the men who do the work. By this you can see how manufacturing supports a vast population.

Another great source of New England's wealth is its commerce. If you will look at the coast of Maine, you may observe that its shores run in and out almost like the teeth of a saw. It is called the "State of One Hundred Harbors." There are fine harbors in Massachusetts, and good landing places for ships all along the south coast of New England almost to New York.

What do you think would be the business of a people with such a coast?

There would be much shipping and many sailors. The boys, hearing the sea captains tell their adventures, would want to go to sea and become captains too. Well, this is just what has happened. There are more than twelve

thousand Maine men who are sailors. During my travels in Asia I found a Massachusetts sea captain commanding a steamer on a Chinese river, and there are New England sailing vessels everywhere. This part of our country has now a large foreign commerce. Boston has in its harbors ships from all over the world, and a great quantity of the American goods which are exported

View of Boston Harbor.

to Europe and other countries is first sent to Boston. Among other large seaports are Portland, Maine; New Haven, Connecticut; and Providence, in Rhode Island, all of which have excellent harbors.

New England is now covered with railroads. On the railroad which crosses the Hoosac Mountains, there is a tunnel almost five miles long. This is one of the most important tunnels of the world. It aids in bringing Boston into direct communication with Chicago and the Mississippi

Valley, and enables much of our wheat and other products to be sent to Boston and carried across the Atlantic. There are sections of New England where the railroads are more numerous than in any other part of our country. They cover its southern states like a net, and in traveling over them we pass an almost endless procession of freight trains taking their loads to or from the many harbors along the coast.

Have you ever thought what a large part commerce has in our daily life? It has to do with every meal that we eat. At our hotel in New York we sat down to dinner before a mahogany table made from trees grown in the West Indies. Our tablecloth was woven from Irish flax, and our knives were of steel made of iron which was dragged from the mines of Lake Superior, hundreds of miles to the westward. We drank coffee which had been imported from Brazil, and the sugar we put into it came from the cane fields of Cuba or Louisiana. We had a splendid cut of roast beef which six months ago was part of an animal galloping madly over some western prairie with a cowboy behind him. We sprinkled it with salt from the salt wells of Michigan, and seasoned it with pepper from the island of Singapore, on the other side of the world. Our bread was of wheat, ground into flour at Minneapolis, and brought down the Great Lakes to be used in New York. The mince pie for dessert was filled with currants from Greece, while the three-cornered nuts with which we finished our meal were shaken from trees in the forests of the Amazon Valley.

We thus see how commerce and manufactures everywhere go hand in hand. The factories of New England use a vast deal of stuff which is brought here by ships from Asia, Europe, and South America, and we can find things from other parts of the world in almost every factory.

Let us visit one of the shoemaking establishments of Lynn, Massachusetts. Some of the leather was imported from Russia; some of it came in the shape of hides from the cattle of the South American pampas, and some from those on the plains of Texas. We see skins which have just arrived from France, Germany, or England, and others which were shipped from India, China, or the peninsula of Korea.

It is in turning the skins into leather that manufacture first joins hands with commerce. The skins, when they

Interior of a Shoe Shop, Lynn.

land in New England, are much as they were when they came from the backs of the animals. They have to be tanned before they can be used. They are soaked for a long time in vats of water filled with tan bark brought from one of the forest regions of our country; next they are

scoured and dried, then greased in order to make them soft, and then covered with blacking; so that a single skin has to be handled many times before it is ready for shoes. The nails, buttons, and strings used in shoemaking are made in separate factories and from materials which come from different localities.

By machinery and by working together men can produce things more quickly and at a much less cost than when one man did all the work with his hands. In the shoe shops of our forefathers one man made the whole shoe, and he probably thought he was doing well if he turned out a shoe in a day. There are machines in the shops of Lynn that will sew six hundred pairs of shoes in one day, and some that will put pegs into the soles at the rate of nine hundred pegs a minute. We find that each part of the shoe is made by a different machine, and that one man works upon certain parts only.

All kinds of manufacturing are now done in this way. It takes many, many men to produce one piece of cloth; and if we should go to Springfield, Massachusetts, where there is a large rifle factory, we might see guns which have hundreds of parts, each made by a different man.

11. AMONG THE MOUNTAINS AND LAKES OF NEW ENGLAND

WE shall spend a part of to-day among the mountains of New England. The Appalachian range. which begins in the northern part of Alabama and forms the eastern rim of the great Mississippi and St. Lawrence basins, runs northward through New England and on into

Canada. It is made up of many ranges, some of which are parallel with one another. With its valleys, it occupies a space almost one hundred miles wide. Its highest elevations are to be found in North Carolina, but its most picturesque parts are in New England. The White Mountain region of New Hampshire is so beautiful that it has been

The White Mountains.

called the Switzerland of America by travelers who have seen the Alps.

The highest of the White Mountains is Mount Washington. We can go in an ordinary train to the foot of this mountain, and from there to its summit over one of the oddest little railroads in the world. The mountain is more than a mile high, and this railroad goes right up to its top. In some places the track is so steep that it looks more like

a ladder than a railroad, and the cars at times are at such an angle that one might think they would slide to the bottom.

This is prevented by an interesting device. The track has three rails instead of two, and the rail in the center consists of two bars of iron, with connecting crosspieces placed four inches apart throughout its whole length. The little locomotive has wheels which rest on the outer rails, and also a wheel with cogs which fit into this central rail, the cogs moving upon the crosspieces. The little car in which we ride is in front of the engine, and the engine pushes rather than pulls us upward into the clouds.

Railroad up Mount Washington.

Upon fine days, such as the one we have for our journey, the car windows are open, so that we can see almost as well as though in a carriage. We sit with our backs to the summit, looking down the mountain; and as we rise behold masses of vapor nestling in the sides of the hills below us. Nearer the top we pass through volumes of mist, and are told that there are many times when the summit of Mount Washington is hidden in clouds.

At last the sun clears the sky, and we enjoy the magnificent views to be had all about us. We can see the other mountains of the Presidential Range. There are Mount Adams, Mount Jefferson, and Mount Madison, all of which are more than a mile high; and near them are lesser mountains, named after Presidents Monroe and Jackson. From the summit we get a peep into Canada, and away off in the distance lies Mount Katahdin in Maine.

There is a hotel on the top of Mount Washington; and we may travel through the Green Mountains in Vermont, the Catskills and the Adirondacks in New York, and about through the beautiful hills and lakes of Maine, and always find good places at which to stay. During the summer these mountains are visited by people from the lowlands, who come here to get away from the heat and enjoy the pure air and beautiful scenery. Maine has large forests of pine and other trees, in which there are still deer and bears, and there is fine shooting in many parts of New Hampshire and Vermont.

Trout Fishing.

We can have good fishing almost anywhere in northern New England. There are trout streams in the mountains, and in Maine hundreds of lakes in which there are salmon and other fine fish. New England supplies a large amount of the fish of the United States, although the most of those exported are caught in salt water.

All along the coast there are thousands of men and boys who fish for a livelihood. Some of them have fishing vessels, in which they go far away from home to what are known as the banks of Newfoundland. They catch millions of dollars' worth of fish every year, and bring them back to the United States for sale.

In our travels through the mountains we shall see the wealth that New England has in its hills. We know that the streams flowing rapidly down them supply the water

power which moves many of the factories in the lowlands. The mountains also furnish other things of value, although they have no great beds of coal and iron, such as are found in the Appalachian chain farther south.

The stone of New England is worth a great deal of money. We find vast quarries in which granite, one of the hardest of stones, is being blasted out with dynamite and cut into blocks, to be shipped to all parts of our country Many of our cities are paved with granite which has come from this region, and some of our public buildings are made of such stone. Beautiful marble is found in New England, and in fact almost half of all the marble used in our country comes from Vermont, though much is now being quarried in parts of Tennessee and Georgia.

A Granite Quarry.

In visiting the various quarries we see that more care is used in getting out marble than in quarrying granite. The rough blocks of marble are cut by what might be called a sand saw. This is merely a long strip of steel. A little groove is cut in the stone, and is filled with a very hard sand. Then the steel strip is moved by machinery back and forth on the stone so that it rubs the sand in the crack against the marble, and the sand does the cutting. After the stones have been sawed into the proper shapes, they are carefully smoothed and polished.

They are then ready for shipment, and are sent away on the cars.

But what kind of stone is of most use to a schoolboy?

Marble? No; that is chiefly for mantels, tables, tombstones, ornamental buildings, and other such things.

Granite? No; granite is employed for building and other purposes where a strong and beautiful stone is required.

The stone which is used every day in many schools is slate, a large part of which comes from New England, although a great deal is quarried in Pennsylvania and elsewhere. Slate can be easily split into the thin sheets which

Collecting Sugar Water — Vermont.

are used for making school slates and slate roofs. In making our slates the sheets have to be smoothed by rubbing them with sand and emery powder. A great many school slates are manufactured at Bangor, Maine, and we can there see boys and girls attending the machines which turn out thousands of school slates every day.

But there is something else made in New England which every boy and girl is glad to get. I refer to maple sugar, which comes from the sap of the maple tree. The sap is gathered in the spring, after the first thaw, at which time it begins to move in the trees. Holes are then bored in the trunks not far above the ground, and little wooden tubes are driven into them. Soon the sap begins to flow. It oozes from the trees into the tubes, and drop by drop falls into buckets which are hung beneath them or placed at the foot of the trees. As the drops hang on the end of the tube they look just like water. Catch one of them upon your finger and taste it. It is sweet. The water in the bucket is called sugar water.

After the buckets are filled, which occurs perhaps once or twice a day, the sugar water is carried to the sugar house, where it is put into large kettles to be boiled. The water evaporates as the boiling goes on, until after a time we have left a sirup which grows thicker and thicker. When it is thick enough for table use, a part is taken out and poured into cans. The rest is boiled still longer and run off into molds, and as it cools it hardens into sugar.

12. IN BOSTON

WE have no trouble in getting to Boston. It is the largest and wealthiest city of the northeastern section of our country. There are railroads to it from all parts of New England, and it has one of the best harbors of the Atlantic coast. It is so situated that it forms an excellent port for shipping the goods made in New England to other

countries by sea, and also for exporting our farming products and other things to Europe.

Boston stands next to New York in the amount of its foreign commerce. Moreover, its harbor and railway facilities allow the materials for manufacturing to be brought in so cheaply that it has become a great commercial city. There are about a hundred thousand persons working in its factories. It has nearly three quarters of a million inhabitants, and is so surrounded by villages whose people do business in Boston that within a few miles of its center there are now living more than a million and a half.

As we step from the cars the crowds seem even greater than they were in New York. The railroad station covers more than eleven acres, and over four hundred trains go in and out of it every day. The city has surface and elevated railways, and also underground roads which carry several hundred millions of passengers each year.

We first visit the old business section. Here the town seems cramped, and the streets are narrow and crooked. The buildings are high, and between Washington Street and Boston Common they contain so many people that they make us think of enormous boxes divided into compartments packed with men carrying on different kinds of work.

We spend some time on Boston Common. This is a beautiful park of forty-eight acres in the heart of the city, which, until about fifty years ago, when Central Park was laid out, was considered the finest playground in the United States. Boston Common is shaded by old elm trees, and at one side of it there is a great oblong building whose golden dome may be seen from almost every part of the city. That is the state house, where the governor of Massachusetts has his offices and the legislature meets every year

to make laws for the state. In the center of the Common is the Frog Pond, about which the boys play in the summer.

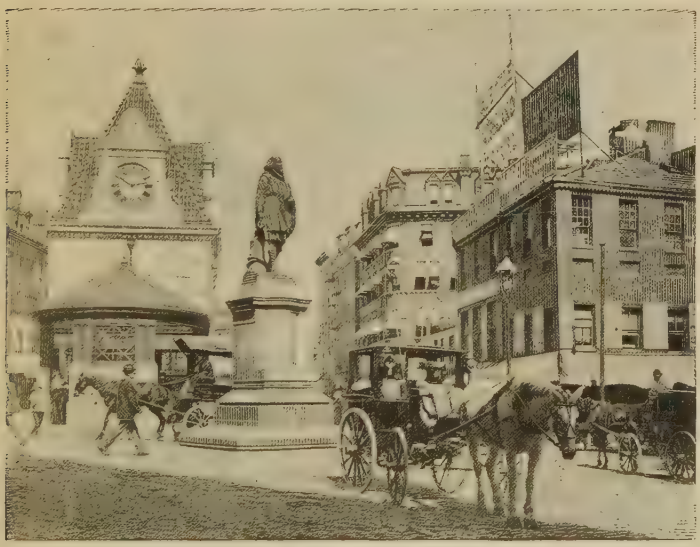
During our tour through the city we pass other fine parks and numerous playgrounds containing open-air gymna-

Boston Common.

siums, and learn that Boston has many beautiful streets. Commonwealth Avenue, for instance, is almost one hundred feet wider than Pennsylvania Avenue in Washington, and through its center runs a park of trees, among which are footpaths. There are fine residences on both sides of the avenue, and at night, when the street is lighted with four rows of lamps, and the carriages and automobiles of rich Bostonians are passing to and fro upon it, it presents one of the splendid sights of the world.

The Bostonians have always been noted for their culture and learning, and some of our best-loved authors

have come from here. Nathaniel Hawthorne, who wrote the "Wonder Book" and the "Tanglewood Tales" was once employed in the Boston Custom House; Prescott, the blind historian, the author of the "Conquest of Mexico," lived in the city; and Bancroft, Longfellow, Lowell, and Holmes



Scollay Square, Boston.

resided at Cambridge near by. The city has large book stores and publishing houses, and its libraries and museums are among the best to be found anywhere. It has musical, scientific, and other schools, as well as several large colleges. At Cambridge we visit Harvard University, which has now more than six hundred teachers and about five thousand students. It is the oldest institution of its kind in our country, having been founded in 1636, or more than sixty years before the opening of Yale at New Haven, Connecticut. Yale and Harvard were for a long time the most

famous of our colleges; but to-day there are good schools and colleges in every part of the United States.

Harvard Gateway.

It was in Cambridge that General Washington took command of the army of the Revolution. This was on the 3d of July, 1775. Boston was then in the hands of the British, and General Washington besieged it. We can visit Dorchester Heights, where Washington put his cannon during the last of the siege. From these heights he could fire upon the city and at the ships in the harbor, and thus he forced the British to leave.

Bunker Hill Monument.

New England people have always been noted for their bravery. Everywhere in Boston we see things which remind us of the stirring times of the past, when it took real courage to be a true American citizen. Let us ride out to the Bunker Hill Monument. It stands on the site where the Americans fought the British so bravely before Washington came. This section of Boston is now thickly settled, but the monument marks the place of the battle. It is a shaft of granite, the corner stone of which was

laid by General Lafayette in 1825. There are steps inside it by which we can walk to the top and look over the city. On the ground below us we see the statue of Colonel William Prescott, who commanded the Americans that day. It represents him as he looked when the English were coming, and when he held back his men until they could do the most damage, saying: "Don't fire till I tell you! Don't fire till you see the whites of their eyes!"

Later on, as we stroll along the wharves of the harbor, we think of the famous Boston tea party, when fifty of the men and boys of the town, disguised as Indians, ran yelling down to these wharves, and boarding the English ships which were loaded with tea for America, emptied the chests of tea into the water.

Old North Church.

The English government had said that Americans must pay taxes upon their tea, but the Americans claimed that the English had no right to tax them without their consent. Hence they refused to drink tea, or to wear any kind of goods from England upon which they had to pay taxes. They decided to dress in clothes made in America, and to drink tea of sage, sassafras roots, and other American plants.

When the English people heard how their tea had been destroyed in Boston, they became angry, and the English Parliament said that no more ships should come into the Boston harbor until the city paid for the tea. This caused great trouble in Boston, and aided in bringing on the Revolutionary War. To-day England is glad to send goods to Boston without any tax. Into this same harbor,

which was then closed, now come much of the goods which our people buy of England, and out of it go vast quantities of products which we sell to her.

We next visit the old North Church, in the steeple of which the lanterns were hung that night when the British soldiers started out to march against the Americans at Lexington and Concord. The lanterns were to tell the patriots across the river that the British were coming. This signal had been planned by Paul Revere, who so bravely carried the news from Boston to Lexington. While a friend was hanging up the lanterns, Revere crossed the river in a rowboat, passing close by a British warship on his way. He found his patriot friends astir, and messengers were soon hurrying in all directions to rouse the Americans. Longfellow's poem tells how Revere sprang to his saddle, and then there was —

"A hurry of hoofs in the village street,
A shape in the moonlight, a bulk in the dark,
And beneath, from the pebbles, in passing, a spark
Struck out by a steed flying fearless and fleet;
That was all! and yet through the gleam and the light
The fate of a nation was riding that night;
And the spark struck out by that steed in its flight
Kindled the land into flame with its heat. . . .
You know the rest. In the books you have read
How the British regulars fired and fled, —
How the farmers gave them ball for ball,
From behind each fence and farmyard wall;
Chasing the redcoats down the lane,
Then crossing the field to emerge again
Under the trees at the turn of the road,
And only pausing to fire and load.

"So through the night rode Paul Revere;
And so through the night went his cry of alarm
To every Middlesex village and farm, —

A cry of defiance and not of fear,
A voice in the darkness, a knock at the door,
And a word that shall echo for evermore!

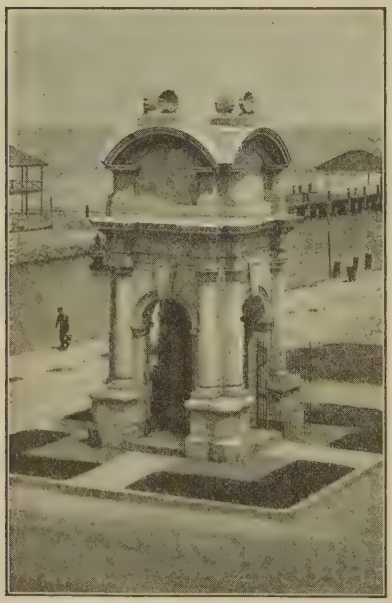
For, borne on the night wind of the past,
Through all our history, to the last,
In the hour of darkness and peril and need
The people shall waken and listen to hear
The hurrying hoof beats of that steed,
And the midnight message of Paul Revere."

The story of early New England is made up of fights with the Indians and fights with the British. Nearly all the ground over which we have traveled has been fought for again and again.

There are many places about Boston which will always be noted in the history of our country. Plymouth, where the Pilgrims landed from the *Mayflower* after they had crossed the ocean, is only thirty miles away. We reach

it by railroad in but little more than an hour. It is now a beautiful little city of about ten thousand people, and as we look at its comfortable homes we cannot realize the hardships our forefathers suffered during their first winter in New England.

The *Mayflower* came into the harbor at Plymouth on a cold December day in the year 1620. She had just one hundred passengers. On account of their religion they had been driven from England to Holland, and had now come to America that they might be able to worship God in their own way. They stepped from their boat upon a great stone, which has become famous as Plymouth Rock. This rock is now honored by all New England people, and we find a part of it in Plymouth under a canopy of dressed stone.



Plymouth Rock.

From the time of their landing, the Pilgrims were in great fear of the Indians. They had no houses at first, and in the rude huts which they put up they suffered such privations that more than half of them died within less than a year.

We find many relics of these times in Pilgrim Hall. Here is the very sword which Miles Standish, the chief

soldier of the colony, used in his fights with the Indians; and, what is even more interesting, the cradle in which the first white child born in New England was rocked. This cradle is a little wicker affair with rockers of wood. It is much like a basket with a sort of hood at the back. As we look, we can see in our imagination poor little Peregrine White, for that was the baby boy's name, crying in it all alone; and we can realize somewhat the extent to which our country has grown when we learn that there are now more than two million American babies born every year.

13. FROM NEW ENGLAND SOUTH BY STEAMER

WE leave New England to-day. We are bound for the lands of the sun. There are good steamers from Boston to all our southern ports, and we take ship for Norfolk, Virginia. We steam out of the harbor, and sail about Cape Cod, along the Atlantic coast, past New Jersey, Delaware, and Maryland, to the mouth of Chesapeake Bay. Much of the time we are out of sight of land, and it is about two days before we see the lights of Cape Charles, and pass over what is known as Hampton Roads to the mouth of the James River.

Here on our left is the thriving seaport of Norfolk, and upon our right, beyond the wharves grain elevators, and shipyards of Newport News, is Old Point Comfort, where Captain John Smith landed with his party from England when he first arrived in America in 1607, thirteen years before Plymouth was founded. Captain John Smith stayed for a time upon this point, near where the little town of

Hampton now is, before he sailed up the James River and founded Jamestown.

It was at Hampton that Captain Smith had his first meeting with the Indians. There are Indians at Hampton now, but we find them more friendly than those who greeted him. Our Indians are far different from the half-naked redskins, with paint on their bodies and feathers on their heads, who roamed through America when the English colonists came. The Indians we see belong to the famous Hampton Institute, devoted to the education of negroes and Indians. Here boys and girls from many of the savage tribes of the West come to school. They dress as we do and learn to lead civilized lives. They are taught English; the boys learn trades and the girls how to cook, sew, and keep house.

Captain John Smith.

The climate is warmer here than it is in New England. There are many new plants and other things which show us that we are in a different part of our country.

What a great number of colored people we see!

We are now in Virginia, the lands of which, like those of the states farther south, were once composed of large plantations, worked by negroes as slaves. These people belong to a different race from the whites. The first of them were brought by force from Africa to be used as slaves. They were kept in slavery until freed during the great Civil War between the North and the South. After the war was over, nearly all the colored people remained in the South. In some southern states, such as South Carolina and Mississippi, they still number more than the whites. There are so many of them that they make up more than one tenth of all the people of the United States.

Our colored people are, as a rule, good citizens. Hundreds of thousands of them now own their homes and farms, many have learned trades or professions, and a large number have engaged in business of various kinds. Nearly all of them send their children to school, and not a few colored boys and girls are going to college. We find hundreds of them being educated at the Hampton Institute.

But let me tell you an interesting thing about Norfolk. You may know that it has a good harbor; for it is at the mouth of the James River, and large steamships come to its wharves. You may have heard that many millions of oysters are brought here in the shell from the beds at the mouths of the rivers which flow into Chesapeake Bay, and that they are here opened and shipped to the markets all over the country.

A Peanut Vine.

These are not the things I want to tell you. It is about peanuts. Norfolk is the chief peanut market of the United States. From here tons of peanuts are sent out every year, and we may see the crop growing all about Norfolk. The nuts are also raised in other parts of Virginia, and in North Carolina, Georgia, and Tennessee.

When we think that peanuts are usually sold in small quantities, at five cents a pint, we can hardly believe that

the crop can be of much value. But there are so many pints of peanuts sold every year that altogether they make up several million bushels, and a good crop sometimes brings as much as ten million dollars.

Many of our peanuts are shipped from Norfolk to Europe. There they are put into presses, and the oil is squeezed out of them by machinery. Peanut oil is wholesome and palatable and is cheaper than olive oil. It is used in salads, and in cooking, and for other things.

But how do you think peanuts are raised?

They do not grow upon trees, or even on bushes. They grow underground, and are sometimes called ground peas. They are planted like potatoes or corn. The nuts are first shelled, the farmers being careful not to break the little red skins on the kernels. It takes about two bushels of nuts in the shell to furnish the seed for an acre, and an acre planted will produce, according to the richness of the soil, from twenty to one hundred bushels.

The nuts are planted in hills or in rows, and are plowed and hoed to keep down the weeds. The planting is done in May. Soon the little green vines peep forth from the ground. They spread over the hills, sending out little stalks on which the flowers grow. These stalks with the seed pods finally run down into the soil, where the seeds ripen into peanuts.

In the fall the nuts are ready to harvest. The vines are then dug up, and after the earth has been shaken off they are stacked around poles seven feet high, with the nuts hanging to them. About two weeks after this the nuts are picked from the vines by women and children, who are paid so much a bushel.

The nuts are still covered with earth, and the next process is cleaning them by machines much like the fanning

mills used by farmers for cleaning grain. After this they are sorted by colored women and children, who pick out the bad ones as the nuts pass by them on a moving belt about a yard wide. The peanuts are now ready for market and are put into bags to be shipped to all parts of the world.

From Norfolk we take the steamer which sails up the James River to Richmond, the capital of Virginia. The James is wide for some distance from its mouth. The land along the banks is low, and the soil is good. As we look at the rich farms on both sides of us, we can imagine how happy Captain John Smith and his company felt as they sailed over this same river, now more than three hundred years ago. We have traveled but a few hours when we reach the point where they stopped and began building what they thought was to be the great city of the New World.

Tower at Jamestown.
(The church itself was rebuilt in 1907.)

This was Jamestown, or, as they called it, James City. It was the chief settlement in Virginia when Virginia included our whole eastern coast from Maine to Georgia. New England was called North Virginia at first, and it was not until Captain John Smith visited it that it was named New England.

There is nothing like a city at Jamestown now. All

that was left when I visited it some years ago was the ruined ivy-covered tower of the church. This stood upon an island in the river, but the waters were fast eating away the banks of the island, which have since been walled in with stone. Not a man was in sight. The only sign of life was a cow, which was eating grass near the ruins, and the only sound was the croaking of a frog that was peeping out of the water from under the bank.

The Jamestown colony had a worse time than the Plymouth colony. The Indians fought them, hiding for a time in the woods about the little settlement, and killed every one who ventured out. During one of their sieges of Jamestown the colonists could get nothing to eat, and were forced to feed upon dogs, horses, and all sorts of reptiles, such as snakes and toads. That was when the colony had grown to the extent of five hundred by the landing of more ships from England. The period was known as the Starving Time; and when it ended with the arrival of a shipload of provisions, only sixty out of the five hundred were alive.

You would think that with such troubles the English would have given up trying to settle America. The colonists discovered no gold as they had been told they would. They saw, however, that the land was rich, and as time went on found that there was much money to be made in the raising of tobacco.

We do not think it is good for men to use tobacco. Still this plant has had a part in the history of our country. It is to-day one of our most valuable crops, and we decide to go south from Richmond to visit some of the plantations and learn how it is raised.

No one in Europe knew anything about tobacco until Columbus discovered America. The tobacco plant was

first found on our hemisphere, and among the wonderful stories which the explorers of those early days told, when they returned to Europe, was how the Indians ate fire and breathed the smoke out of their nostrils. Many of the travelers learned to use pipes, and to smoke as the Indians did. They introduced the custom into Europe, and tobacco

Tobacco Field.

smoking became fashionable among the ladies and gentlemen of that time.

Sir Walter Raleigh was one of the first smokers in England. One day, it is said, when he was puffing away at his pipe, a servant came in with a pitcher of ale in his hand. This man had never heard of tobacco, and when he saw the smoke coming out of Raleigh's nose he thought his master was burning up, and threw the ale over him to put the fire out. Raleigh had sent several expeditions to America,

and Ralph Lane, the captain of one of these, brought some tobacco home with him.

As the custom of tobacco using grew, the crop became valuable. It was long the chief product of Virginia; and at one time the colonists used it as money, so that a man could take pieces of tobacco to the store to buy sugar and tea and other things for his table.

We now sell vast quantities of tobacco every year to the people of Europe, Asia, Africa, and South America. More

Tobacco Auction.

of this article is produced in the United States than in any other country. Our tobacco crop is sometimes worth more than one hundred million dollars, and a great part of it is used in other lands.

Tobacco is now raised in almost every one of our states and territories. Our chief tobacco lands are in Kentucky, Virginia, North Carolina, and Tennessee, but large amounts

are also raised in Ohio, Pennsylvania, Wisconsin, Connecticut, and South Carolina. The climate and soil in parts of these states seem to be just fitted for the plant, and we see tobacco fields everywhere as we ride along the southern boundary of Virginia and through North Carolina. The leaves of this plant are much like cabbage leaves, but they are longer and smoother and of a dark-green color. The stalks are as big around as our thumbs, and some are so tall that if we stripped off the leaves we could use them for canes.

It is by no means an easy thing to raise tobacco. The seed must first be planted in a bed, made by covering a piece of ground with wood, and burning it, so that all the insects, vegetable matter, and seeds are killed. After this the bed is manured and the tobacco seed sown. A wide sheet of thin cloth is then spread over the bed to hold in the heat and to keep out the insects.

How big do you think a tobacco seed is?

It is so little that you could put a million in your pocket. It is not bigger than a mustard seed, and one ounce contains, it is said, three hundred and forty thousand seeds. They are so small that they have to be mixed with ashes or earth before planting, in order that they may not be too thickly sown.

The planting is done in the spring. After a short time the little green sprouts come up, looking much like cabbage plants. They are now taken up and set out in hills, four thousand plants to the acre. They are carefully cultivated throughout the summer and are harvested in the fall. As the plants ripen the leaves become yellow. At this time the tobacco farmer cuts off the stalks close to the earth and hangs them on sticks which are stuck in the ground. In some places he strips the leaves from the stalks and strings them on wires.

The leaves must be dried or cured before they can be sold. This is done in tobacco barns such as we see on nearly every little farm as we ride through the tobacco lands. They are usually wooden cabins without windows, in each of which is a heating arrangement consisting of a stove with flues or pipes that run through the barn. The leaves are hung up in the barn, and the place is kept as hot as an oven, day and night, until they are thoroughly cured, when they are tied up in bundles and carried to market. Much of the tobacco is sent to the various factories of the United States to be prepared for smoking and chewing, and for making cigars and cigarettes.

14. IN THE LAND OF COTTON

LEAVING the tobacco lands, we move on farther south, and soon find ourselves in the great cotton belt of the United States. This begins in North and South Carolina and runs down through Georgia, Mississippi, Alabama, Louisiana, Arkansas, and Texas. There is some cotton raised in other places, but these states yield the greater part of the crop, Texas producing the most.

Do you realize how important the cotton crop is to our country?

It is so great that if all the gold dug from the mines of the earth in one year were put into one pile, and that part of this crop which we annually send to Europe were stacked up beside it in another, the cotton pile would be the more valuable.

We often get six times as much from our cotton as from our gold and silver mines. We raise the best cotton of the world, and about two thirds of all the cotton worn by man comes from the wooly fiber of our plantations. There are yellow people in Asia, black people in Africa, red Indians in South America, and white people in Europe all dressed in our cottons, and every one of us wears more or less of them. We do most of our sewing with cotton thread. Our common dresses and shirts are made of cotton, and at night we sleep between cotton sheets.

But why does America produce so much more cotton than any other country?

It is because it has the conditions best fitted for it. Cotton requires a warm climate with not too much moisture. This is found in the cotton belt, and best upon the string of islands which lie off the Atlantic coast of South Carolina and Georgia. Upon these islands grows what is known as the sea-island cotton. The plants there are four or five times as large as those of other parts of our country. The ripe cotton shines like satin, and it is made up of fibers which are longer than those of any other cotton.

Have you ever seen a cotton plantation?

The fields when ripening form one of the most beautiful sights of the world. There are acres of plants, about as high as your waist, and upon them white bunches which look like soft balls of snow.

We pass many such fields in our travels. They line the sides of the railroads. Some are dotted with people picking the cotton. Negroes and whites walk through the rows and pull the white lint from the stalks. They sing as they work, and their rich, soft voices float into the car windows as we ride by.

At many of the stations there are huge bales of cotton waiting to be shipped to the factories of New England or

Picking Cotton.

to other parts of the country. Some will go to the seaports, where they will be rebaled and exported to Europe. Every little farmhouse we pass has one or more bales in its yard. Upon the country roads we see wagons filled with what in the distance looks like newly washed wool. It is freshly picked cotton on its way to the gin, where the seeds must be taken out before it can be sold.

But let us stop and visit one of the big cotton plantations of South Carolina. There is a field which is not yet ripe. It is filled with green bushes as high as our waists, upon

"Let us examine the cotton."

which are the bolls containing the cotton. The largest bolls are of about the size of a walnut with the hull on it. Farther over we can see a field in which some of the bolls are cracking open; the green bushes seem dusted with white. Those bolls are almost ripe, and the cotton will soon be ready for picking.

Look farther on. There is a spot where the soil must be richer. The bolls on the lower branches are all open, and great tufts of white, as large as pop-corn balls, hang out as if ready to drop into the hands of the pickers. The bolls on the higher branches are still closed.

Cotton Bales Ready for Shipping.

Let us go into that ripening field and examine the cotton. We pull some bunches of white from the bolls. They come out so easily that they almost fall into our hands. What are the hard little things we feel inside the soft white lint? Let us pick it apart and see. Those are the cotton seeds. They are as big as the seeds of a lemon, and they must all be removed before the cotton is sold. We shall see how this is done later on.

It is from such seeds that the cotton plants grow. We ask the farmer as to the raising of the crop, and he tells us that his seed was put in in April, in rows of hills about three feet apart. He says the sprouts soon came through

the soil, and by the middle of June the field was filled with green plants upon which were many beautiful flowers. As the blossoms first open they are white; the next day they turn red, and when in full bloom look like beautiful roses. They soon drop off, however, and the bolls of cotton appear. The bolls do not crack open until they are ripe, and then only the white fibers show out.

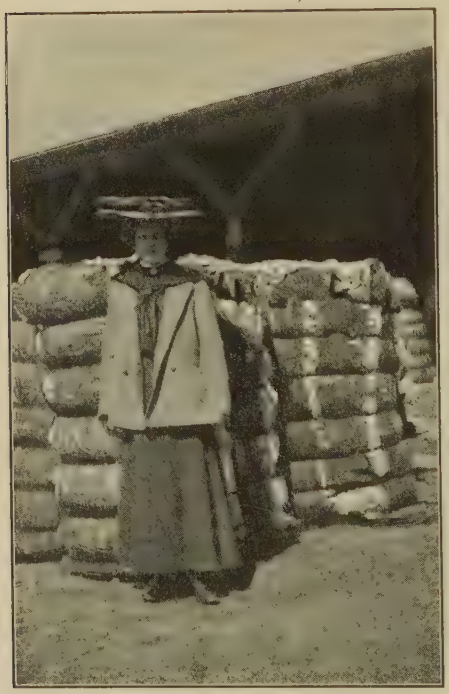
From what we have seen we know that the plants do not all ripen at once, and for this reason the pickers have to go

Baling Cotton.

over a field many times. In Texas and other parts of the far South the picking season begins in July. Farther north it is later, and in Georgia and South Carolina some of the cotton is often still on the stalks at Christmas.

After picking, the cotton is carried to the gin. There is

a wagonload now. Let us jump in and go along with it. The negro driver is good-natured, and he laughs loudly as we climb into the load of the fleecy white cotton. At the ginhouse we crawl out, covered with lint, and watch the men throw the cotton into the top of a machine where it falls between fine circular saws so arranged that the seeds can just pass between them. The lint is caught by the teeth of the saws, while the seeds drop below.



Baled Cotton.

Between the saws are stiff brushes which pull the cotton from the saw teeth and roll it out in a beautiful, fleecy sheet, so that as it drops on the floor at the side of the gin it looks like a drift of snow.

That cotton is now ready for baling. By this is meant packing it into such bundles as will take up the least space on the cars or ships upon which it is to be carried to the markets. This is done in huge presses which so squeeze the cotton together that a great quantity of it is pressed into a bale about four feet square and five feet in length. It is next wrapped with

rough cloth much like coffee sacking, and bound with bands of hoop iron. The ordinary bale weighs from four hundred and fifty to five hundred pounds. It is worth from forty to seventy dollars or more, its price varying according to the amount of the crop in different parts of the world.

But what becomes of the cotton seed?

This is carefully saved. It is so valuable it often brings in more than one hundred million dollars a year. A few years ago it was supposed to be worth nothing, and was burned or thrown away. Now it is used for making oil and other things. The seeds are ground, and the oil is pressed out. The crushed seeds are used for making an oil cake, which is valuable for feeding cattle and other stock. The hulls of the seeds, which are taken off before pressing, are also used for feeding and as a fertilizer.

Cotton-seed oil is largely employed in the making of soap. Much of it goes into patent butters, such as oleomargarine; and a great deal, when purified, is used for cooking, for salads, and for other things instead of olive oil. It is said that a large percentage of the olive oil sold in the United States is really cotton-seed oil. Many of the laborers in the oil mills do not butter the bread which they take with them for lunch, but use the oil instead. They put the slices cut from the loaf under the press, where the sweet, warm, fresh oil is trickling out, and then eat them with relish.

Let us follow the cotton still farther, and see how it is made into cloth. Until within recent years all our great cotton mills were in New England. We saw many at Lowell, New Bedford, Fall River, Manchester, Lawrence, and other cities as we passed through, and we know that the most of our cotton cloth is still made there. We find, however, that many factories are now being built in the South.

There are large mills at Charlotte in North Carolina, at Spartanburg, Greenville, and Columbia in South Carolina, at Atlanta and Augusta in Georgia and at many other places in the different sections of the cotton belt. The cotton states have good water power, and the plantations are so near the mills that they can make cloth very cheaply.

The factory we visit is at Spartanburg, South Carolina. It is in a brick building of three stories, covering several acres. It contains many large rooms filled with interesting machinery, and hundreds of white men and women are at work within it. The cotton is taken almost directly from the gin to the factory. Suppose we follow a bale as it passes through one room after another, until the fleecy white lint is turned into cloth.

We first take up some raw cotton out of the bale and pull it apart. What queer stuff it is! It is composed of thousands of little white hairs, so fine that several of them twisted together would not equal the thickness of a hair of your head. These little cotton hairs are called fibers. They are not so long as your finger. There are millions of them in a few pounds of cotton, and in our big bale more perhaps than there are people in the United States. Still, of these tiny hairs the strongest of thread and cloth are to be made.

Our bale is first taken apart, and the cotton is then thrown upon huge cylinders or rollers called openers. These pull at the fibers, separating each as far as possible from the others. After this, the cotton thus loosened is passed through other rollers the sharp teeth of which pick out the fibers, leaving the dirt, so that when the cotton comes from them not a stick, a leaf, or a grain of sand is left in it. It now feels soft and is whiter than it was in the bale.

The next process is carding. Here the cotton is run through rollers covered with wire teeth so fine that there

are more than a score of them on a space as small as one's finger nail. These little teeth brush and comb the cotton much as we comb our hair. As the cotton passes through them they pull the tangled fibers apart and make them lie almost altogether one way, so that when they come out at

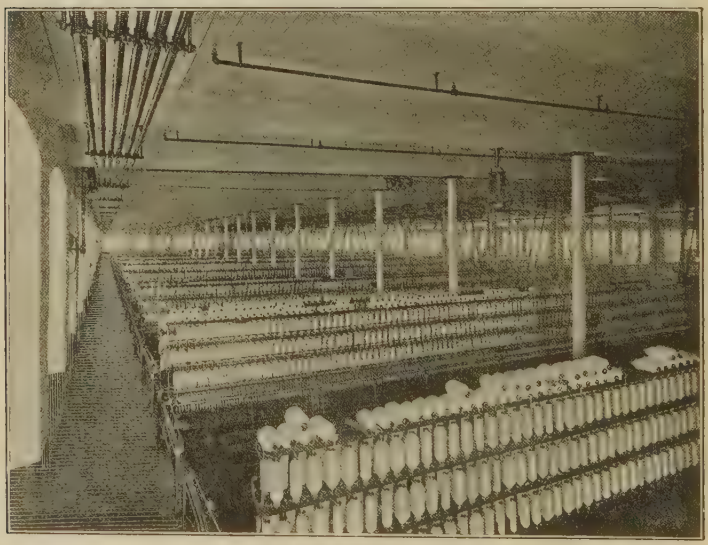
Making Cotton Threads.

the other end of the roller, they form a soft rope of cotton yarn. It is of this rope that the thread is to be made.

The rope is as big around as a broomstick. It seems enough for a dozen threads, but it is not enough to make one. It is as soft as down. It is doubled again and again as it goes through other machines which twist it finer and finer until at last it is not thicker than a fishing line. It is still soft, however. Another strand of the same size twisted in the same way from another cotton

rope, is now joined with it, and the two are twisted and re-twisted by machinery until they are as small as the finest cotton thread used for sewing. This is the thread out of which the cloth is to be woven.

As the thread comes from the machines some of it is rolled upon long spools, called spindles, by what is known as the mule spinner. This takes the place of the old



Mule Spinner.

spinning wheel, save that it winds hundreds of spools at a time, one machine often doing as much work, perhaps, as in colonial days a thousand women could do. Some threads are wound upon rollers or beams of the width of the cloth to be made. These threads are the warp; they run lengthwise in the cloth.

The cross threads, or what is known as the woof or filling, are first wound upon small bobbins, and are then thrown

from one side of the cloth to the other in the shuttle, which carries the thread back and forth through the warp threads at the rate of one hundred and fifty times or more a minute. This is called weaving. The machines with which the weaving is done are the looms. The machinery in the weaving rooms makes a great din, and the looms work so fast that thousands of yards of cloth are woven in one factory in a day.

We shall visit other mills as we go on with our journey; and at every large port we shall see ships taking on cotton for the factories of New England and Europe as well as for those of China, Japan, India, and South America. The latter countries all raise more or less cotton, but they also use our cotton with theirs, as the mixture makes better cloths of some kinds. By far the greater part of our crop goes abroad, the exports of raw cotton bringing in hundreds of millions of dollars a year. Our best customer is the United Kingdom of Great Britain and Ireland, which is the chief cotton-weaving country of Europe, and after it come Germany and France. There are also large weaving mills in Holland, Switzerland, Italy, Austria, and Russia.

All of the foreign factories pay us money for the cotton they buy, and part of that money goes to the boys and girls on our southern plantations as wages. In those factories tens of thousands of foreign boys and girls are kept busy spinning and weaving, and from the cloths they have made comes the money paid us; so you see they are working for us. And as they must have our cotton to carry on their business, we are working for them. Moreover, this is also true of the little black, brown, yellow, and white children of other parts of the earth who buy cloth made from our cotton at home and abroad, so that the whole world really seems to be tied together with these cotton threads. Indeed, the

human race by industry and commerce becomes more and more every day like a family, each member of which is always helping the others and being helped by them.

15. AMONG THE RICE FIELDS

WE see more and more cotton as we go farther south into Georgia. There are cornfields here and there. We visit great peach orchards, and ride through sections where they are raising watermelons for the markets of the

Ox Carts.

North. There are more colored people here than in Virginia. We see scores of them at the stations or in the fields at work; they also stand in the doors of their little cabins, watching our train as we go whizzing by.

How many mules there are! In some sections of the southern states there are more mules than horses. Now and then we see a negro driving an ox hitched with rope harness to a rude, old-fashioned cart.

The towns we pass are not so large as those of New England, but buildings are springing up about many of them, and near each of the cotton mills is a little colony of new houses.

Rice.

We find Atlanta to be one of the beautiful and thriving cities of our southern section. It is a great business and manufacturing center. It is situated so high above the sea that it has a delightful climate in the summer, and so far south that its winters are not cold. We spend some time in the state capitol, take a stroll under the old forest trees along Peachtree Street, upon which are the finest residences; and then go by the electric cars to see the battlefields where terrible fighting was done during the Civil War.

Atlanta has railroads branching out in every direction, and we take a train which carries us eastward to the Atlantic Ocean. Here we visit the islands off the coast where the fine sea-island cotton is raised; and along the lowlands bordering the Atlantic travel through a country dotted with fields of rice. The rice is now almost ready for cutting. It is of a bright yellow color, and at first sight makes us think of wheat or oats. As we come nearer we see that its straw is different from wheat straw, and that the little grains upon it are not at all like any grains raised in the North.

We can see water shining out at the roots of the plants, and are told that a great deal of moisture is needed to

develop the crop. The best rice is raised where the ground can be frequently flooded with fresh water. The plants must also have the hot sun, and hence we find the best rice-raising lands of the United States along the lower parts of our warm South Atlantic and Gulf coasts and in the hot, moist country near the lower Mississippi River. Texas, Louisiana, Arkansas, and South Carolina produce the most of the rice raised in the United States, and the chief rice-shipping ports are New Orleans and Charleston.

Let us visit one of the rice plantations near Charleston, South Carolina. We shall learn that raising rice is not at all easy. The fields have little banks about their edges, so that the water, when let in upon them, will stay there, forming a pond covering the whole field. The plants are grown in the mud. The beds are flooded, and in a short time the sprouts poke their little green heads up through the water. After this the water is drawn off until the stalk forms a joint. The soil is then plowed and hoed. Water is again turned in, and is allowed to remain until the straw turns yellow, when the rice is ripe and ready for cutting.

The harvesting of rice is much like that of wheat and oats. The straw is cut and shocked up in the fields, and after a short time threshed to get the grain out. When the threshing is done, the process of preparing the rice for the market has only begun. Each little grain has a hull on it, which does not come off in the threshing. These hulls stick as tight as though they were glued. Before the rice can be sold, they must be removed. This is done by running the grains through hulling machines. As the rice comes out of the machines it is rough, and other machines are used, by which each grain is rubbed and polished until it is smooth and glossy.

Some rice is raised on the higher lands without water. This is known as upland rice. It is grown in almost the same way as wheat and oats in the North.

The greatest rice fields of the world are in Asia, where the rice is raised in flooded fields. In some parts of that continent so many people eat rice that it takes the place

A Rice Field.

that bread has with us; it is said that one fourth of all of the people of the world live upon rice.

Have you ever heard how rice first came to America? There were no such plants here until about two hundred years after Columbus discovered this continent. Take your map of Africa, and find the island of Madagascar, which lies off its east coast. It was from that island in 1694 that a ship started out, and after a long voyage came into the Atlantic Ocean, and was driven by a storm into

the port of Charleston. The captain of the steamer had a sack of rough rice with him; and upon leaving he gave it to one of the citizens, who planted the grain in a low place in his garden. A big crop was the result. This man gave some of the seeds to his friends, and within a short time rice became one of the chief products of this part of the United States. In 1913 the amount of our

A Street in Charleston.

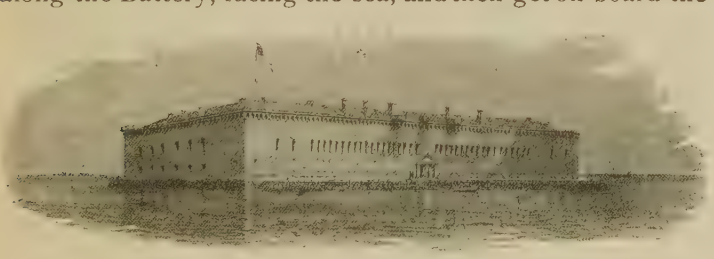
rice crop was estimated to be almost twenty-six million bushels and its value was many millions of dollars.

We see bags of rice ready for shipment on the wharves of the Charleston harbor. There are also steamers loading cotton for Europe, and other ships are being filled with a sort of phosphate rock dug from the ground near here, which is of great value for fertilizing.

Charleston is one of the most interesting cities of the South. It is built on a peninsula at the mouths of the Ashley and Cooper rivers. It is laid out in square blocks, the cross streets extending from river to river, and the

other streets cutting them at right angles. Charleston is an old city; it was founded only sixty years after the Pilgrims landed at Plymouth; and it has always been noted as an important commercial point. Many of its streets are wide, and some are lined with large houses, at the sides of which are broad lawns and gardens. These old mansions have, in front and at the sides, big pillars which support porches or galleries, forming cool places during the hot summers. Back of some of them we can still see the quarters and cabins which were occupied by the negroes in slave times; and as we observe the many colored people on the streets we are reminded that South Carolina has a large number of this race among its inhabitants.

After a walk along Meeting Street, we visit Citadel Square and ride out on the cars to the Magnolia Cemetery to see the live oaks draped with Spanish moss and the many beautiful flowers. Upon our return we take a stroll along the Battery, facing the sea, and then get on board the



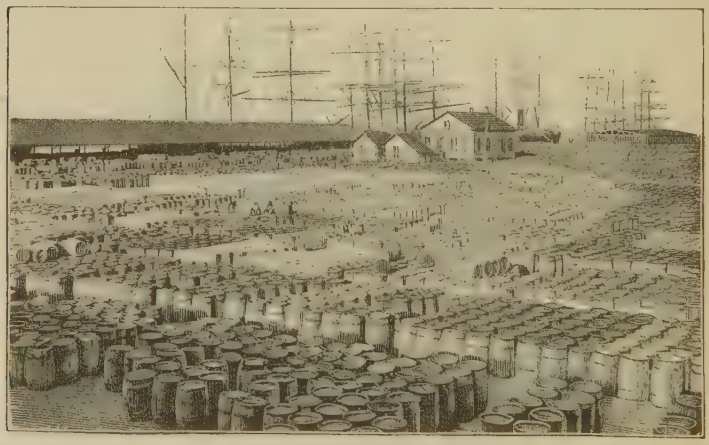
Fort Sumter.

little steamer which goes several times a day to the most interesting points in the harbor. We visit Fort Sumter, where the first shot was fired at the beginning of the Civil War. The fort is on a little island at the entrance to the harbor not far from the shore. The island is made of

rocks. It is surrounded by brick walls about forty feet high and eight feet thick. Grass-covered earthworks are still to be seen on some parts of the wall.

16. A VISIT TO A TURPENTINE FARM

LEAVING Charleston, a few hours' ride by rail to the southward brings us to Savannah, a thriving seaport near the mouth of the Savannah River. Savannah is famous for its cotton presses and rice mills, and especially



On the Wharves at Savannah.

as the chief port of the world in its shipment of turpentine and rosin. At certain seasons of the year its wharves are covered with barrels of such materials, awaiting shipment to Europe. Large quantities are also being loaded upon cars and steamers for every part of the United States.

Turpentine and rosin are made from the sap of the long-leafed pine tree. Turpentine is a transparent liquid used in making varnish and paint. Rosin waxes the bows of violins; it is also employed in the manufacture of soap, and is especially valuable for varnish. Our own furniture is probably coated with the juice of the pine trees of the forests of Georgia or the Carolinas, and from the same source comes the turpentine used in mixing the paint on our houses.

The process of getting out turpentine and rosin is known as turpentine farming. A turpentine farm is a forest of long-leaf pine trees, each of which has been so cut and scarred that the sap oozes out and may be collected for making turpentine. There are farms of this kind all along our South Atlantic coast from North Carolina to Florida, and farther inland near the Gulf of Mexico to Louisiana.

For many years the most of our turpentine came from North Carolina; but turpentine farming soon kills the trees, and the pine trees there are almost used up. The best turpentine farms are now farther south. There are hundreds about the cities of Savannah and Brunswick, and we shall see them in Alabama, Louisiana, and other parts of the Gulf states.

Each farm consists of thousands of pine trees. The trees are not large around, but they are perfectly straight, and so tall that they sometimes reach to the height of an eight-story house before their branches begin.

There is but little underbrush, and we can easily walk through the woods. Every pine tree has one or two scarred places upon it where the bark and wood have been chopped off. These places begin at the foot of the tree and extend upward two or three feet. As we look, we see

that a hole or box has been cut in the tree at the foot of each scarred place, and that the white sap is oozing from the wood and running down into the box.

The size of a turpentine farm is known by the number of boxes. Ten thousand five hundred boxes make what is called a crop. There are farms which have millions of boxes, and in which, during the fall and winter, hundreds of negroes are kept busy scarring the trees and getting the sap. The men labor in gangs, under an overseer. Two men work together, taking a tree at a time. One man stands on each side of the tree, with an ax in his hand, and they chop in turns. For this reason, whenever it is possible, a right-handed man and a left-handed man work together.

Scarring the Trees.

The gathering of the sap begins as soon as it moves in the spring. At this time it oozes out in thick white drops on the cut places and falls down into the boxes. It soon hardens, forming a gum about as thick as molasses.

Every few days the boxes fill up, and the men come along and scoop out the liquid. Each has a keg with him, and he empties the sap into it as he goes from tree to tree. When his keg is full he carries it to a barrel, in which it is taken to the turpentine distillery.

During the summer the trees must be cut again and again to keep the wounds fresh. Such drops of the sap

as harden on the trees are scraped down into the boxes. The next year a place is cut a little higher up on the tree to furnish sap for that season, but the yield of the second year is not so good as that of the first. The sap grows darker from year to year, and after five or six years it becomes so dark that it is not valuable, and the tree is ready to die.

But let us follow the barrel which we have seen filled with the sap, and learn how it is turned into rosin and turpentine. As it oozes out the sap is of a waxy, gummy nature, and the question is how to get the turpentine out. It will take eight barrels of sap to make two barrels of turpentine, and what remains will be rosin. This is the work of the turpentine distillery.

A Turpentine Distillery.

We can tell we are nearing the distillery long before we get there by the aromatic smell of the rosin. It makes us think of the sealing room in a canning factory, for rosin is used in soldering the cans. It grows stronger as we

approach the big shed of the distillery, and we now perceive that it comes from the gum or hardened sap which is boiling to get out the turpentine.

We stay a few moments to see how this is done. The gum is first mixed with water, and then put into a great kettle set in a brick furnace in which hot fires are kept. As it melts, the turpentine rises in a vapor and goes off into pipes kept cold by streams of spring water which flow over them. As the vapor touches the cold pipe it condenses, turns to a liquid again, and at the end flows out in a stream of pure, transparent turpentine. It is now run into barrels, and shipped to the markets. The rosin which has been left in the kettle by the boiling has become thick. It is also put into barrels, where it soon hardens, and is then ready for sale.

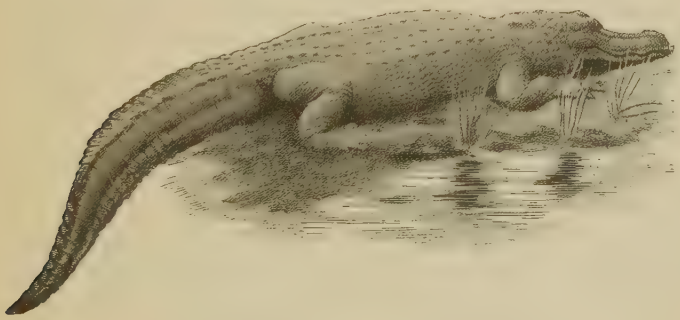
We are now on the eastern edge of the great pine forest belt which runs from North Carolina parallel with the coasts of the Atlantic Ocean and Gulf of Mexico, to eastern Texas. This belt is from sixty to one hundred and fifty and more miles wide, and it contains many millions of acres of valuable timber. At every few miles along the railroads, which have been cut through it, are sawmills where the trees are being made into boards; and upon the tracks are long trains of lumber of various kinds starting out to the cities of our eastern and central states.

The pine trees grow on the thin, sandy soil of these regions where the hard woods will not thrive. The latter are found only in the valleys and at the north higher up in the mountains behind the pine belt, with gum and cypress trees in the swamps.

The pines are of several well-known varieties. The long-leaf or Georgia yellow pine is very valuable. It is used largely for floors and for the inside woodwork of houses,

and the same is true of the better grades of some of the other varieties of pines, such as the North Carolina and Virginia pines, and of the Cuban pines. We are told, however, that lumber is growing so scarce that trees of almost every description are now being cut, and as we see the vast quantities shipped, we wonder whether in time our woods will not all disappear.

In our travels the railroads carry us for miles through the swamps, of which there are many throughout the south. Some of them are so large that they have never been explored. The Okefinokee Swamp in Georgia has regions as dense as the jungles of tropical countries, and quagmires in which a horse or a man might sink out of sight. The swamps of Georgia and Florida contain all sorts of snakes, and in some of them alligators by the hundreds crawl through the muddy waters.



17. FLORIDA AND ITS ORANGE GROVES

THE Florida peninsula forms the southeastern end of our country. It lies nearer the equator than any other part of the Union except southwestern Texas, and this, added to the warm winds from the Gulf Stream which

washes its southern and eastern shores, gives it a semitropical climate. It is a land of luxuriant vegetation, and of many beautiful trees and flowers. The word "Florida" means "Flowery," and we learn that the name was given it by Ponce de Leon, its discoverer, who landed at St. Augustine on Easter day in the year 1512, only twenty years after Columbus first came to America. De Leon was looking for the fountain of perpetual youth, and he thought the land so beautiful it must surely contain it. He wrote about his new country as the "Island of Florida," and established a settlement at St. Augustine, the first white colony on the North American continent.

Florida remained in the hands of the Spanish for more than two centuries. For a while it came into the possession of both France and England; but it was returned to Spain, and by our treaty with that country in 1819, was made a part of the United States. This was at about the time that General Andrew Jackson, who afterwards became President, was fighting the Seminole Indians, and he had much to do with our getting the peninsula. So in 1822, when it was made a territory, he was appointed its first governor; and its capital, the city of Jacksonville, was named after him.

Florida is one of the low lands of our country. Nowhere in it is there a hill as high as the Washington Monument. The Everglades in the southern part of the state are almost all swamp, and may be described as a huge shallow lake of about the size of Massachusetts, filled with low, marshy islands and abounding in fish and wild birds of many kinds.

The soil of this state is largely composed of material from the sea floor. Much of it is sandy, with coarse rock underneath, the latter made by the millions of coral polyps which live in the warm waters about its coast. This is especially

true of the southern part of the peninsula where the land drops out of sight, a little coral island poking its head up through the water here and there, forming the Florida Keys, which end in Key West.

Key West is a habitable island with a well-fortified harbor. It is not far from Cuba, and many of its people are engaged in making cigars, the tobacco being brought from the port of Havana, which is only a few hours away. They also catch turtles, and some are employed in taking out the sponges found in the waters near by.

The climate of this region is delightful. In the summer the heat is tempered by the breezes from its long seacoast, and in the winter it is warm when our northern states are covered with snow. This has caused many invalids to move to Florida to live, and thousands of our northern people go there to escape the cold of the winter. Therefore we find that railroads have been constructed to take care of the visitors; and had we time we might ride on the cars along the whole eastern coast of Florida and finally out over the coral islands at its southern end to Key West, where we should be within only about ninety miles by water, or a few hours by steamer, of Havana, in Cuba.

Upon the latter part of this trip we should be carried for miles upon a railroad over the sea. The Florida Keys may be called a series of stepping stones leading into the ocean. They extend in a curve from the end of the peninsula to Key West, the channel separating the islands varying in width from a few hundred feet to several miles. The water between them is not deep, and great concrete bridges or viaducts have been built up so that there is now a sea-going railroad clear to Key West, of which about seventy-five miles seems to rest, as it were, upon the water.

We have an excellent train from Savannah to Jackson-

Sea-going Railroad to Key West.

ville, the largest city and chief seaport of the state. It lies on the St. Johns River, which connects it with the Atlantic. We see large ocean ships at the wharves and also side-wheel river boats, upon which one can travel up the St. Johns into the heart of the country.

After leaving Jacksonville, we steam for a long distance through what seems a great lake. The St. Johns has been called a miniature Amazon, and we see why as we go. The river which rises in the Everglades and flows north almost

Live Oaks and Spanish Moss.

parallel with the ocean is often a mile and more wide. We sail a long distance before it grows narrower, and we then pass through forests of palmettos, live oaks, and cypresses, the branches of which are loaded with Spanish moss. This moss looks like frosted silver. It is a sort of air plant which

crawls over the trees, hanging down from the limbs, and in some places almost reaches the water. Much of the earth along the banks is sandy. We miss the green turf of other parts of our country; and although our surroundings are beautiful, we long for the velvety grass of the North.

We find, however, that every part of the world has its own beauties. The wild flowers of Florida comprise many that are grown in northern hothouses, and there are hundreds of tropical plants not found in the other parts of our country. In some places we go through jungles so dense that we imagine ourselves in the hot lands of Africa. The air is soft and balmy in the evenings and mornings, but at midday, even on the river, the sun is so hot that we have to keep under cover.

A Pelican.

We see curious birds on our voyage. Herons and buzzards fly about overhead; and long-legged cranes and big-throated pelicans stand in the mud on the edge of the river. Now and then an alligator scrambles down the muddy banks as it hears the noise of the boat.

The streams which flow into the St. Johns furnish excellent fishing. Florida is one of our best fishing grounds. It is the home of the delicious red snapper; and of the tarpon, our biggest fish that can be caught with a hook. Many a tarpon, if stood upon its tail, would be as tall as a man; and some have been caught which weighed more than one hundred and fifty pounds. Tarpon fishing requires a strong line. The sportsman often has to fight with the fish for

hours; he lets it run with the hook this way and that until it is tired out and can at last be dragged to the boat.

As we travel up the St. Johns we pass many little farms and orchards, and learn that this region is the chief winter fruit and market garden of the cities and towns of the north. It raises millions of watermelons and muskmelons, vast quantities of early tomatoes, and about two million bushels of sweet potatoes a year. It produces guavas, olives, and Japanese persimmons and plums, as well as limes, lemons, and grapefruit, while its two leading fruit crops are oranges and pineapples.

"Florida is one of our best fishing grounds."

We have to go some distance south before we reach the best orange-growing districts. There are oranges in all parts of the state, but the fruit is liable to be spoiled by the frost. There are some excellent groves on the Indian River.

We have no trouble in getting a permit to visit the orchards. Oranges are as common in Florida as apples are in New England, and we are asked to go in among the trees and pick all we can eat.

How delicious the fruit tastes when fresh picked. The oranges are more juicy than any we can buy in the stores. How full the trees are! Some are so loaded that the golden balls shine out everywhere through the emerald-green leaves. It is said that there are single trees in

An Orange Orchard.

Florida which bear as many as five thousand oranges a year.

We ask the owner of one of the groves how the orange trees are grown. He replies that it takes from five to ten years after planting for a tree to come into bearing, and adds that there are trees which have been known to produce fruit when they were more than one hundred years old.

The orange crop is an important one. Hundreds of millions of this fruit are eaten in the United States every year. We import some from Sicily, an island in the Mediterranean Sea, and also from the West Indies; but

our best oranges come from this region, and from California, on the other side of our country.

"We pick grapefruit, which we eat sweetened with sugar."

In this same region we quench our thirst with lemonade made from fruit fresh from the groves, and pick grape-

fruit, which we eat sweetened with sugar. The lemons and grapefruit grow much like oranges; the latter are often twice as large as the largest orange. They are of a pale lemon color, and are beautiful as they hang on the tree.

In southern Florida we see great fields of pineapples and coconut groves. The coconut is a species of the

A Pineapple Field.

palm. It begins to bear at from nine to twelve years, and a good tree will have at one time as many as one hundred and fifty coconuts on it. Pineapples grow upon the ground not unlike cabbages. They are planted during the months of July, August, and September by means of slips and suckers which grow on the old plants. The land is well plowed, and the slips are set out at about twenty inches apart so that ten thousand or more can be grown on an acre. They are carefully cultivated, and at the end

of twenty months are ready for the markets. They are often picked green and allowed to ripen during the shipping. We are given some ripe from the field, and find them far more delicious than any we have tasted before.

Most of southern Florida is wild. One can ride for hundreds of miles in boats through the swamps, and he will find there bears, wildcats, and deer. If we should take a swim in the water, we must look out for alligators, and we shall hardly be safe, in some parts of the Everglades, without guns in our hands.

18. THROUGH THE MISSISSIPPI JETTIES TO NEW ORLEANS

IT is at Tampa, on the west coast of Florida, that we get a ship that will take us across the Gulf of Mexico to the mouth of the Mississippi River. The Gulf of Mexico does not look large on the map, but in places its eastern and western shores are farther apart than New York and Chicago. Our best route will be to go first to Mobile, the chief seaport of Alabama, and thence by a short steamer ride to the mouth of the Mississippi and up to New Orleans.

We enter the Mississippi River through that one of its mouths known as the South Pass. The Mississippi has several mouths through which it flows into the Gulf of Mexico. The land here has been built up during the ages by the mud or silt of the uplands carried down by the river. The waters of the Mississippi are loaded with mud, and they discolor the Gulf of Mexico far out from the mouth of the river. It is said they bring enough silt into the Gulf every

year to make an island a mile square and several hundred feet high.

You might think so much mud would stop up the river. So it would were the current not strong enough to carry it out into the Gulf. As it is, the mud has built up great bars not far from the mouths of the river, over which ships cannot easily pass.

Our steamer, however, crosses one of these bars through the channel formed by the Mississippi River jetties. These jetties are river walls, which have been made in a curious way. They were planned and constructed by Captain James B. Eads, in order that ships might go through the bars from the Gulf into the deep waters of the river, and thus reach New Orleans and the other cities upon its banks. Captain Eads saw that the Gulf was much deeper a little beyond the bars. He believed that if he could make confining walls on both sides of the channel, the water would flow so much faster that it would carry its load of mud far out into the Gulf and at the same time would cut a channel through the bar. He laid his plan before Congress, and was given the money to carry it out. It proved to be a success. The river now flows through with great force, and a channel, several hundred feet wide and over thirty feet deep, has been made, through which ships can go in from and out to the Gulf of Mexico.

But how were these jetties made?

It must be difficult to build walls in the sea. First, many rows of tall tree trunks, or piles, were driven into the bed of the Gulf on both sides of the channel so that they formed thick walls running from the end of the land through the water, over the bars, and on into the Gulf. Some of the piles were driven down into the bed of the Gulf to a depth of thirty feet in order that the walls might be strong.

But the trees alone could not have kept back the water. It would be as easy to stop a brook with your hand as to keep back the Mississippi by tree trunks. Solid and closely built embankments were needed; and these could not be made with mortar or stone, for there was no way to keep back the water while the masons were working.

How do you think they did it?

They called upon the river to help them. First they cut millions of willow twigs and limbs, and tied them together into great rafts. They floated these rafts in among the piles, and then loaded them with heavy stones and gravel until they sank to the bottom. Then they floated other rafts just over these, and sank them in the same way, until at last there were walls of willow and stone on each side of the channel from the land's end far out into the Gulf of Mexico.

A Street Scene.

These walls were soon made tight by the water. The silt-laden Mississippi, as it flowed through the willows and rocks, dropped enough mud to fill the spaces between them; and now there are solid walls several miles long on each side of the channel. The river rushes through with such force that it carries its mud far out into the Gulf, where the water is so deep that it does not affect travel.

The greater part of New Orleans is on the left bank of the river, about a hundred miles from the Gulf. We pass many vessels as we sail into the Mississippi, and they increase in number as we approach the city. New Orleans is the chief seaport of the Mississippi Valley. We go by steamers piled high with cotton bales, and pass others loaded with barrels of sugar, and some filled with grain to be carried to Europe. New Orleans is fast becoming one of our chief grain ports, and vast quantities of wheat from the upper parts of the Mississippi Valley are shipped by this route every year to the markets of Europe.

A Cemetery, New Orleans.

From the deck of our steamer we can see for miles over the country. In some places the land is lower than the surface of the river, and levees, or high banks, have been built up to keep back the waters. This is the case with

parts of New Orleans. The city lies about ten feet below the surface of the Gulf, and so far below the level of the Mississippi at flood times that in some places levees twenty feet high have been built to keep out the water. There are but few spots in the city where one can dig many feet without striking water, and for this reason there are not many cisterns or cellars. In some of the cemeteries the graves are above ground, and we visit one where the coffins are laid away in vaults, resting one on top of the other, as though in a great file of pigeonholes.

We find New Orleans interesting. It is more like a European city than any other place in the United States. It first belonged to the French. A little later Spain owned a large part of our country northwest of the Gulf of Mexico, and New Orleans then became the chief Spanish town of the New World. After that the territory again came into the possession of France, and in 1803 it was sold by the French to the United States. You may have read in your history of the sale as the "Louisiana purchase." By that purchase we got some of the most valuable parts of our country.

When Louisiana was made a state, New Orleans was its capital, and it remained so for many years, although the capital is now Baton Rouge. When the Spanish took the city, the people objected. The Spanish had to fight for possession; and after that they surrounded it with walls and fortifications. During our War of 1812 it was besieged by Sir Edward Pakenham, with a force of twelve thousand Britons, but he was defeated by General Andrew Jackson with six thousand Americans. The battle lasted only a short time, when the British fled, leaving twenty-six hundred killed and wounded behind them.

In our Civil War, New Orleans was long in the hands of the Confederate troops. It was ably defended, but was

finally taken by Admiral Farragut, whose ships slipped by the forts above the city at night and captured a number of the Confederate vessels which were defending it.

New Orleans was then only a town. It is now a city. It has several hundred thousand people, but it still shows the walls made by the foreigners who founded it. It has long streets of old houses with tiled roofs, somewhat like the buildings we see in the pictures of Italy and southern France. There are wide porches, or galleries, built from

Canal Street, New Orleans.

the second stories of the houses over the streets, so that we can walk for blocks keeping out of the rain or sun, except at the crossings.

In some parts of New Orleans there is as much Spanish and French spoken as English. Suppose we visit the French market. This is one of the largest in the city. It is not far from Canal Street, the chief business highway,

and we can easily walk to it from our hotel. We find that many of the marketmen are French, Spanish, and Italian, and those who are buying use a strange jargon in making their bargains. At some of the stalls vegetables are sold by the lot, and not by the bushel, peck, or quart. They are arranged upon tables in piles, and each marketman fixes the price of his piles. The buyers take those which they think are the biggest and cheapest.

Let us walk down to the wharves. The city has a great commerce. Grain, cotton, and other products come down

On the Wharves at New Orleans.

the Mississippi and its tributaries in ships and barges, and many ocean steamers go through the jetties carrying them to Europe. There are railroads from here to all parts of the North, East, and West. The river is about half a mile wide and from sixty to two hundred and forty feet deep. It gives the city and its suburbs a water front of over twenty-five miles, which for the greater part is lined with

wharves and docks. New Orleans is the chief cotton-shipping port of the world, and hundreds of thousands of bales are sent from here to Europe every year. The cotton comes down in boats and on the cars from the plantations of the Mississippi and Gulf states. It is first hauled to compresses, where it is squeezed into smaller bundles so that it may take up the least possible room on the steamers.

As we get nearer the wharves, we see huge drays loaded with cotton. They are pulled by mules driven by negroes, who sit high up in the air on top of the bales. Let us follow one and see how the pressing is done.

The wagon goes through the narrow streets not far from the banks of the river. Here are many low buildings surrounding large yards, which can be entered only through iron doors. These are the cotton yards. We go into one and see that it is walled around with immense sheds filled with cotton bales. The court is covered with cotton, and the pavements outside are so piled up with bales that we find it hard to pass through.

As we look, a loaded dray comes in through the doors. The bales are rolled off and weighed. They are then wheeled on low trucks to another part of the yard, where the great pressing machines are at work.

As the cotton comes in, each bale takes up about as much space as an ordinary kitchen table. It is as high as our shoulders and about four feet square. It has already been squeezed by the machinery of the plantations into as small a package as was possible without the use of the great cotton press.

But see, the man who has wheeled in that bale has already cut the iron hoops with which it is bound, and as he does so the cotton swells out as though taking a breath of relief. It swells more and more as it is thrown

into the press, not seeming to realize that those huge jaws of iron above and below will crush it harder than ever.

There is a steam engine close by; and, as we look, the engineer pulls a lever, and the two heavy steel jaws move towards each other. The bale of cotton seems to groan as the jaws squeeze it tighter and tighter, until at last it is not so high as your knee. It has been pressed from a thickness of four feet to one of twelve inches; and as it lies there thus squeezed, the iron straps are again fastened around it. As the monster machine lets go, the bale swells out a little, trying to burst its iron bands, but in vain. It is now pulled forth and rolled upon another dray, which is waiting to carry it off to its dark prison in the hold of the steamer. Such pressing costs but little, and it is more than repaid by the increased number of bales that can be stowed away on a ship.

19. A VISIT TO A SUGAR PLANTATION

HAVE you a sweet tooth? If so, you must be careful in your travels with us to-day. New Orleans is one of the chief sugar markets of the United States. There are thousands of barrels of sugar piled up on the wharves, and there are streets of the city in which so much is being refined that we can smell nothing else as we walk through them.

We are now in the land of sugar. There are vast plantations in this part of the country where sugar cane is cultivated, and we can here learn how cane sugar is made. We saw how maple sugar is produced in New England by

boiling down the sap of a tree. In the western part of our country a great deal of sugar is made from beets; but cane sugar comes from the plantations of the rich, moist lands about the Gulf of Mexico. We do not produce all the sugar we use. We import beet sugar from Germany, and cane sugar by the shipload from the West Indies, the Hawaiian Islands, and Brazil.

There are scores of sugar plantations, some of which contain thousands of acres, within a few hours' ride of

A Sugar Plantation.

New Orleans. The one we shall visit to-day is so large that it has a railroad upon it to carry the sugar cane from the fields to the factory. It employs so many people that their houses would make quite a large village, and the buildings of its refinery cover several acres.

We must take the railroad train to go to the plantation. Leaving New Orleans, we go for miles through fields of sugar cane. Now and then we see the smoke of a huge

factory streaming out against the blue sky. We pass through swamps whose trees are loaded with Spanish moss, and at last stop at the station built upon the estate.

We first take horses for a gallop over the plantation. There are roads through the fields, and we go for miles between walls of green cane. The leaves of the stalks rise above our heads as we sit on our horses.

Cutting the Cane.

Have you ever seen a great field of corn, ready for cutting?

Such a field looks not unlike a sugar plantation when the cane is ripe. The sugar cane, however, is much higher than the corn, and its stalk has several broad leaves where the corn stalk has one. Many of the sugar-cane stalks are fifteen feet high; they are planted so close together in the rows that it would be almost impossible for one to make his way through them.

But before we go farther, let us stop and learn how the cane is grown. The planting is not like corn planting. Corn is raised from the seed and is always planted in the spring. Sugar cane may be planted in either fall or spring, and in place of the seed, pieces of ripe stalks are laid flat in furrows which run from one side of the field to the other. The furrows are about seven feet apart. The stalks are so laid down that they fit close together, three being placed side by side, making three long rows or pipes of cane in each furrow. Next, the soil is thrown over the cane with a plow. In the spring sprouts start up from each joint of the cane, making long ribbons of green, as it were, against

the black field. These sprouts grow rapidly. In August they have become as tall as a man, and they grow on until the middle of October, when they are about twice as high as the average corn stalk and are ready for cutting. This is the size of the cane on the plantation we visit.

We stay for a while at one end of the farm, where scores of men and women are cutting the cane. They labor in squads, under an overseer; and as they stand in the fields they face what looks like a solid wall of green. Each has a knife, which flashes in the sunlight as he cuts his way through the wall.

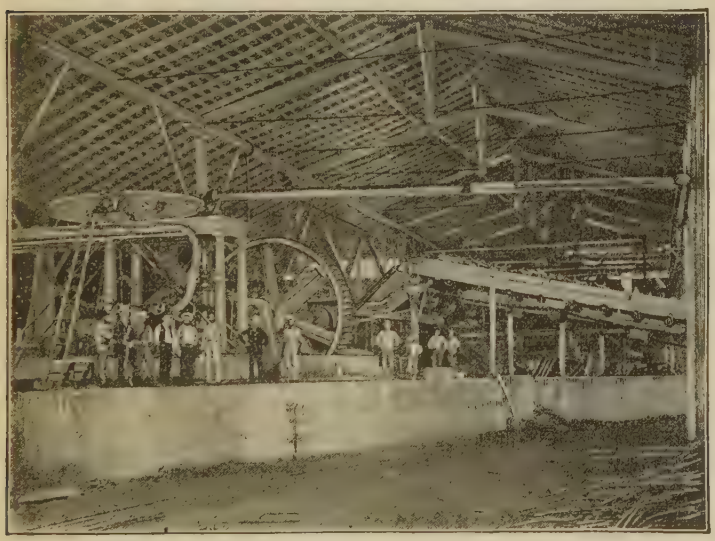
See how carefully and how quickly they work! They seem to know just how many strokes to use, so that not a motion is wasted. The sweetest juice is found near the bottom of the stalks, and for that reason they cut them off close to the ground. The tops and leaves are worth but little for sugar, and so they strip each stalk of its leaves and cut off its top before they go on to the next. The stalks, when cut, are thrown into piles, or windrows, from which they are taken in carts to the cars.

There is a loaded train ready to move. Let us jump on and go with it, and see something of the work it takes to produce a spoonful of sugar.

On our way to the factory we cross large canals. We are told that the plantation was at one time a swamp, and that the land had to be drained before the cane could be planted. We have already learned how much work it takes to grow cane. We are now about to see the wonderful machinery required to get the juice out of the stalks and turn it to sugar.

Our car stops at one of a group of large buildings. The cane is thrown off upon a moving belt, or roadway, which carries it to the top of the big mill, and drops it down upon

two heavy rollers, which have teeth much like those of an enormous file. The rollers are each as large around as a hogshead and much longer. They are of steel, and so arranged that a great weight can be added to them by machinery. As the stalks fall upon the rollers, the teeth catch hold of them and pull them in. The weight is such that the juice is squeezed out, and as the cane comes forth it is crushed to a pith, and is as dry as a last year's corn



Interior of Sugar Mill.

stalk. It is so dry that it burns easily. As it comes from the rollers it falls upon a moving belt which drops it into the top of the furnaces, where it forms the fuel that makes the steam to squeeze the juice out of the stalks yet to come, and also to run the other machinery of the mill.

But what becomes of the juice? Come with me under the rollers and see. It is pouring down from them in streams

into a trough about a foot wide. We dip in our fingers and taste the liquid as it falls from the cane. It is so sweet that it is sickening. It looks dirty, and reminds us of dishwater. Still, out of this sweet, dirty water the pure white sugar will come. But every bit of dirt must first be taken out of it, and it is made as clear as crystal before it is boiled down into sugar.

The water is first carried by pipes into large iron tanks, where it is bleached by running sulphurous acid gas through it. The gas makes it bubble, and a yellow foam rises to the top and is skimmed off. Lime is now put into the tank to settle the dirt and remove the acid. After several such processes, the water becomes clear.

It is now ready for boiling. This is done in huge copper kettles or vats, heated by coils of steam pipe. The liquid is skimmed as it boils. It flows from one tank to another, growing clearer and clearer, and thicker and thicker. Taste it now. It is the purest of sirup, and its color has turned a light yellow.

Look at the sirup as it seethes in the tank! What an enormous amount there is of it! Let us follow the pipes through which it is emptied into the immense vats on the floor overhead. There is enough sirup here to give the children of a whole state a taffy pulling. At the left is one big barrel which contains forty thousand pounds of sirup, all boiling and seething in the process of being made into sugar.

Come with me now to that great vat, and see the half-sugared molasses within it. The vat is twice as long as our parlor at home, and so deep that if we fell in we should be drowned in the mixture. Let us take up a spoonful. It is as thick as mush, and in fact is a mush of molasses and sugar.

It needs now only the drying machine to take out the sugar. In this process the mixture is whirled round at great speed, being thrown against the fine meshes of a sievelike vessel in which it is placed; and the molasses passes through, leaving only the white crystals of sugar. After a time the walls of the vessel are coated with what

Where the Sugar Cane Grows.

looks like snow. This is pure sugar, which is now ready to be packed up in barrels and shipped to the markets.

The coarser sugars are not so carefully cleaned, but most of our fine sugar is made in this way.

But what becomes of the molasses? This word, used in a sugar refinery, means the refuse left after making the sugar. It contains the poorest parts of the juice after all the sugar possible has been taken from it. Such molasses is different from that sold as sirup, which is made from the fine juice of the cane. The refuse molasses is so cheap that it often brings as little as one cent a gallon. At such times

it does not pay to put it in barrels, for the barrels would be worth more than the molasses; and so it is carried to the markets in tank cars, and sold largely in bulk.

20. UP THE MISSISSIPPI RIVER TO ST. LOUIS

WE leave New Orleans on a steamer this morning for a tour through the Mississippi Valley. This valley contains more than one third of all the land of the United States. It has more rich soil than can be found in one place in any other part of the world. It is almost all good land. It lies in the temperate zone, and forms one of the best dwelling places for civilized man.

The Mississippi, including the Missouri, is the longest river of the world; and, with its branches, it has one of the most extensive river systems of the globe. One might cross the Atlantic Ocean from New York to Liverpool three times, and not go as far as he could sail upon the waters of the Mississippi and its tributaries.

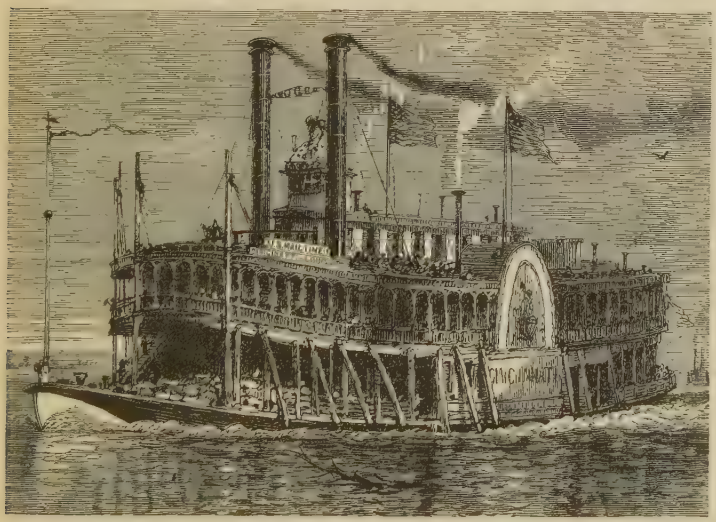
As we see this system on the map, it seems like a huge tree, with its roots in the Gulf of Mexico, and its mighty branches spreading out over the richest lands of the United States. It is the chief water highway of the central part of our country, and an almost endless procession of boats and ships is always moving up and down the trunk and through the various branches. We pass scores of vessels as we leave New Orleans.

Our steamer makes us think of a floating house of three stories. The lower ones are filled with freight; above them are our sleeping and dining rooms, and the hurri-

cane deck is the yard where we play and stroll about, watching the banks on both sides. We are moved through the muddy waters by those great paddle wheels at the sides of the boat, which its steam engines keep going day and night.

How green and beautiful everything is!

At times we are sailing through forests of cypress trees, loaded with Spanish moss. The trees are so bound to-



A Mississippi Steamboat.

gether with grapevines and dense vegetation that they form green walls on each side of the wide, yellow river; and the only living things we can see are the birds which hop from branch to branch, and now and then a few people at the clearings, where little farms have been cut out of the woods.

Now the Mississippi widens, and we seem to be traveling through a series of lakes. We pass swamps and float by fields of sugar cane and cotton.

Now and then we stop to take on or leave freight and passengers at the villages on the banks; and farther up the stream, at Natchez and other cities, we load packages of goods, bales of cotton, and hogsheads of tobacco. Rough-looking men and boys, most of them colored, load and unload the steamers. They sing as they work, making a great noise as they roll the huge bales down the gangplank.

A Cypress Swamp.

At Vicksburg we stay for some hours. Here there are immense elevators on the banks of the river, and bales of cotton, barrels of flour, and bags of grain are rolled down into the boat. All kinds of things are brought to the steamer. We see hundreds of crates of chickens taken on board to be carried to market. Each crate is just high enough for the chickens to stand up inside it. They poke

their heads out of the slats and squawk complainingly at us as the men carry them upon the boat.

All the way to Memphis we pass steamers loaded with cotton, going down to New Orleans. Memphis is one of the most important cities below the mouth of the Ohio. There are so many boats at its wharves that they make us think of a seaport. There are steamers ready to sail up the Arkansas and White rivers, and in the busy season one can go by boat every day from Memphis to St. Louis.

How the Mississippi winds in as it flows on its course! From Cairo to New Orleans it is like an enormous snake, only more crooked than any snake could possibly be. Mark Twain, who was once a Mississippi pilot, said that if you should pare an apple so as to leave the whole peeling in one long strip, and should throw the peeling over your shoulder, as it fell on the floor it would look much like the lower part of the Mississippi River. As our steamer winds about through the curves, we see other boats sailing to the right and left along the winding current above and below us; and there are places where we can get off upon the land, and walk across the fields a half mile or so, and there wait for the steamer, which may have to go a dozen miles around to reach the same point.

As we make our way up the river, we notice that banks, or levees, have been built up on each side of it to keep the water from running over the land. There are eighteen hundred miles of such levees, on one side or the other. It has cost many millions of dollars to build them, and every year Congress gives a large sum to improve the navigation of the Mississippi.

Are the levees strong enough to protect the people from floods?

Yes; sometimes, but not always. The Mississippi River

is hard to control. It is always changing its course, always wearing off the land in some places, and piling it up in others. It seems to be ever looking for a weak spot where it can break through its banks. The least crack is soon enlarged by the water flowing through it, and if not stopped at once, the river will pour out over the land.

A Levee.

The moment a break is discovered the people rush forth to fill it. They drive down stakes into the water where the crack is, and put bags of earth between them. They take boats, and throw all kinds of stuff into the break, in order to stop the stream before it can make the hole larger. If the break becomes ten feet wide, it is almost useless to try to keep back the waters. They dissolve the bank as though it were sugar; they cut through the earth like a knife; and when the break has reached a width of a hundred feet or more, the banks drop down into the water in slices half an acre in thickness, and the muddy river with a loud noise rushes over the country.

At such times farms are often swallowed up; islands are made in the stream, and thousands of acres of land become lakes and ponds. The cattle, horses, and sheep, when they see the waters advancing, run to the highest places, and they often starve before the river subsides or the people can come in boats to take them away. The Mississippi floods tear down houses, and one may some-

Flood caused by a Break in a Levee.

times see buildings, with families on the roofs, floating upon the river. The woodpiles on the banks are carried away, and large trees that have been torn up by the roots are rapidly borne along by the current.

On our voyage up the Mississippi we are stopped again and again by the ships and barges coming down. The traffic is enormous. We pass long rafts of lumber from the Red River and the upper Mississippi, with little houses built upon them, in which the lumbermen live during the voyage.

There are huge barges loaded with produce, fastened together in blocks, and pushed by steamboats behind them. Many of the barges contain corn and wheat, and we learn that millions of bushels of grain are thus taken down to New Orleans every year.

Freight can be carried much more cheaply upon water than upon land. The rates on the Mississippi are so low that as much grain as two horses could haul is carried at the rate of a cent for every five miles, and it costs only a few cents to take a bushel of wheat from St. Louis to New Orleans, although the ships require several days to go between the two cities. Coal is carried upon the rivers even more cheaply. Its freight rate is so little that people in New Orleans use coal from the mines of Pennsylvania, although those mines are as far away as Maine is distant from Ireland.

But why does it cost so little to carry heavy things on the water?

We can easily see as we look at the big loads going by us, pushed by small steamers. A little steamboat on the Mississippi can do more work than one several times as large on the ocean. This is because the storms do not affect the rivers as they do the oceans. There are no heavy seas to sail through, and the streams are so quiet that large water-tight boxes or barges can be used to carry all sorts of goods. Moreover, as there are no waves to contend with, one little engine can push many of these barges down the river.

There comes a steamship now, shoving along a half-dozen huge barges piled high with coal. Notice how she puffs as she forces them onward. The barges are fastened together, two moving along side by side. Each barge is as long as a city lot and almost as wide. It is as deep as

from the floor to the ceiling of an ordinary room and, indeed, if we should imagine our schoolroom packed full of coal, we may have an idea of the amount that each of these great flat boats is carrying down to New Orleans.

As we approach the city of Cairo, we are almost stopped by the barges. They have come through the Ohio River from the coal fields of West Virginia, Pennsylvania, and Ohio, the most of them having been loaded at Pittsburgh. The Ohio River may be called the coal chute for the cities of the Mississippi Valley. A continuous procession of barges floats down it, carrying millions of tons of coal to the cities along its banks, furnishing the fuel which makes steam for the factories of Cincinnati, Louisville, and St. Louis.

Union Station, St. Louis.

Leaving Cairo, we find the river much straighter than it was farther south. We sail through a rich farming country and soon reach St. Louis. This city is the most important of all upon the Mississippi River. It is one of our chief commercial and manufacturing centers, being the fourth in size among the cities of the United States.

It is the situation of St. Louis that makes it so important. It is on the Mississippi River, between the mouths of the Missouri and the Ohio, and only a few miles from the mouth of the Illinois River, so that goods can be easily shipped up and down the Mississippi and through all the branches of its system. This makes St. Louis the gateway to the southwestern part of our country, and many of the goods shipped to Mexico go through it. St. Louis is a great railroad center, and a vast number of trains are always speeding to and from it, carrying all kinds of freight. During our stay we look at the huge bridges across the Mississippi, and then visit the Union Railroad Station, which is one of the largest and finest of the world. The trains all back into it, so that the engines are left outside, keeping the smoke out of the building.

We find St. Louis a magnificent city. It has wide, well-paved streets and many large buildings. It has several fine parks, and we enjoy our drives through the residence portion, the houses of which have beautiful yards.

21. INDIAN CORN AND THE CORN BELT

AS we sail on up the Mississippi north from St. Louis, we pass through vast tracts of corn. For hundreds of miles the banks on both sides are lined with cornfields, and we might travel east or west for hours, on fast railway trains, without coming to the end of the fields. We are now in the heart of the great corn patch of the United States, and we decide to stop off and spend some time investigating this wonderful crop.

The corn grows so well here that in some places it reaches above the car windows, and we are whirled along on the trains between walls of green stalks, the wide leaves of which rustle in the wind made by the train as it carries us through them. Now the track runs upon an embankment. We are above the fields, looking over a sea of green leaves, spotted with the golden tassels which form the ends of the stalks. Some of the leaves have turned yellow, the green stalks are streaked with yellow, and the fat ears have husks of a lemon hue.

The Corn Region.

Husking Corn.

The corn crop is now ready for harvest. It is being cut and shocked, and later on the ears will be torn from their husks and carried to the markets.

Pull off one of those ears of corn and look at it. We have before us one of the most wonderful of grains. It is a grain which more than any other belongs to our continent, for it was not known in Europe before America was discovered.

Take one of the kernels and bite it open. How hard it

is, and how white its inside! If you should put it under the microscope, you might find that its flesh is composed of hundreds of little boxes, filled with scores of cells, so that there are thousands of cells in a single grain. Each cell contains starch and other matter good to eat, and corn is one of the best foods for both man and beast.

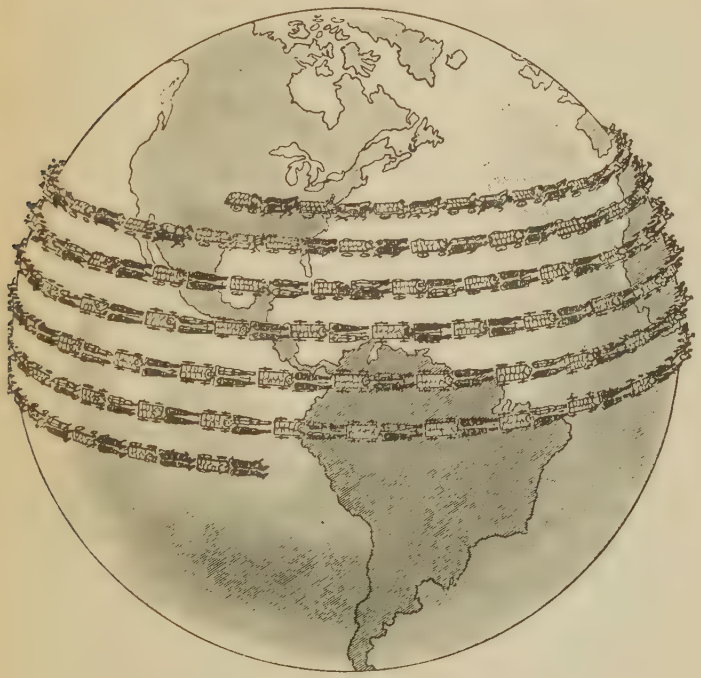
Do you realize how much our corn crop is worth to us? It is by far the most valuable thing we raise. We get more from it every year than we do from all our gold, silver, and lead mines. Our corn crop is often worth more than twice as much as our wheat crop. We produce so much that it is almost impossible to realize how great the amount is. We raise two or three billion bushels of shelled corn every year. The figures are too big for us to understand them, and we shall consider first only the corn grown in this region where we are traveling. Corn is raised in nearly every part of the United States, but more than half of our crop comes from the seven great states of Illinois, Indiana, and Ohio, to the right of us, and Missouri, Kansas, Iowa, and Nebraska, on our left, as we go up the river. This is the most extensive cornfield on the globe. It produces more than one billion bushels every year, which sometimes is one half of our crop.

Now let us think for a moment how much corn one billion bushels is. Suppose we load it upon wagons. Forty bushels of shelled corn make a good load for two horses. Let each wagon hold that amount, and let the teams start at the Mississippi River and go eastward. We shall drive so that the noses of each team will just reach the tailboard of the wagon in front of it, making a continuous train of wagons, each loaded with forty bushels of corn. Now where would the first wagon be when the last bushel was loaded? At Pittsburgh, on the edge of the Allegheny Mountains?

No; it would be much farther eastward.

At the Atlantic Ocean?

No; still farther eastward. Suppose that the wagons could be driven across the oceans, and guess again.



"We should have to make six such lines around the world."

It might perhaps reach almost to Paris, do I hear some one say?

Yes; it would reach, on and on, much farther than that. The line of wagons would extend from the Mississippi over our own country to the Atlantic Ocean, across the Atlantic to Europe, across Europe and over the highlands of Asia, and then across the wide Pacific Ocean. It would not stop

there, but would climb over the plateaus and peaks of the Rocky Mountains, and come back to you at the Mississippi River, making a solid belt of corn wagons clear round the world.

But stop! we have not yet loaded all of the corn crop of these seven states. The pile seems almost as big as when we began. There are five times as much left as that we have put on the wagons, and we should have to make six such lines around the world before we could load a single year's crop. It would take so many wagons that if they were stretched out in one long line, the first wagon would be more than one hundred and fifty thousand miles away before the last was loaded. And yet these seven states contain only about one half of the corn we produce, and you must multiply the number of wagons by two or more if you wish to know how many would be needed to carry one year's corn crop of the whole United States.

But what becomes of all our corn?

Most of it is used in this country. Not one bushel in twenty is shipped to Europe. We can find where much of it goes by visiting the barnyards of the United States. We see the farmers throwing it out to their stock. We have so many cattle and hogs that if we could drive them in single file they would form two lines long enough to guard our wagon train of corn as it is stretched round the globe. In such a march the noisiest animals would be the hogs. There would be more than sixty millions of them, grunting and squealing as they followed the wagons. Corn is the best food for hogs. By feeding it to them the farmer turns his corn into pork, thus making the hogs manufacture the corn into an article that can be more easily sold.

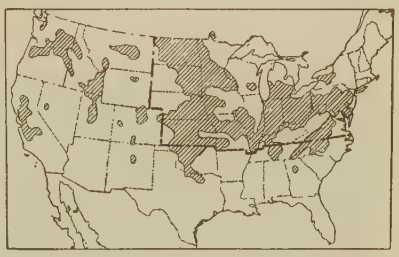
The people of Europe will not buy much corn, but they are glad to get our meat; and so, through this corn belt

where we are traveling, we shall find vast establishments devoted to the killing of hogs and preparing their meat for sale. They are known as packing houses. We may visit them at Omaha, St. Joseph, Kansas City, and St. Louis, where hundreds of thousands of hogs are killed every year, and from where their meat is shipped to all parts of the world.

22. A VISIT TO A GREAT WHEAT FARM

NORTH and west of the upper Mississippi is a region which might be called the "Bread Basket of North America." Here, in both Canada and the United States, are some of the best wheat lands of the world.

Wheat is one of the most important grains known to man. It has been used for ages by the peoples of the Old World. Egypt in the time of the Pharaohs was a great wheat land, and there are pictures on the walls of some of the Egyptian tombs showing how wheat was raised there in those ancient days. Wheat is now grown in every grand division. Great quantities are produced in Europe, Asia, and Africa, and there are vast wheat lands in Australia, in the United States and Canada, and in the valley of the Parana River in South America.



The Wheat Region.

Although wheat was not known in this hemisphere before Columbus came, our continent now produces more than

any other grand division except Europe; and the United States more than any other country. The people of Europe eat also a great deal of flour made from our wheat. We send millions of bushels of this grain every year across the Atlantic; and, with the single exception of cotton, we often get more from foreign countries for it than for any other crop.

Wheat is grown in nearly all parts of the United States, but our best wheat lands lie north of the Ohio and Missouri rivers. In Minnesota and the Dakotas is a region known as the Red River Valley, where the wheat farms are of vast extent, and are managed on a grand scale. Each farm has its bookkeeper and overseers. It employs hundreds of men, and purchases its machinery and supplies by the carload, at wholesale rates. On one wheat farm in North Dakota there are two hundred and fifty pairs of work horses and mules, two hundred plows, a hundred and fifteen harvesting machines, and twenty threshing machines run by steam. When the grain is ripe, four hundred men are employed to harvest it, and at the time of threshing there are six hundred at work.

A Sulky Plow.

But suppose we visit a big Dakota wheat farm. The farm is so large that we ride on horseback all day going over it. Some of the fields contain as much as five hundred acres. The men working in them labor in companies, under mounted overseers, who gallop from one company to another to see that everything is

properly done. Sometimes a score of sulky plows, driven by men who sit on them, move across the field together. They may plow several acres at a single trip, riding over the prairie as they turn under the tough sod.

The ground is harrowed in much the same way, and the wheat is drilled in by seeders, or grain drills. These are long boxes mounted on wheels. Each box is filled with wheat. From its bottom running down to the earth are slender tubes about as big around as a broomstick. Through these tubes the grains of wheat fall just fast enough to seed the ground thoroughly. Behind each tube is a little plow, which covers up the grain. A drill is drawn by two, three, or four horses, and a long line of them will plant a vast tract of wheat in a short time.

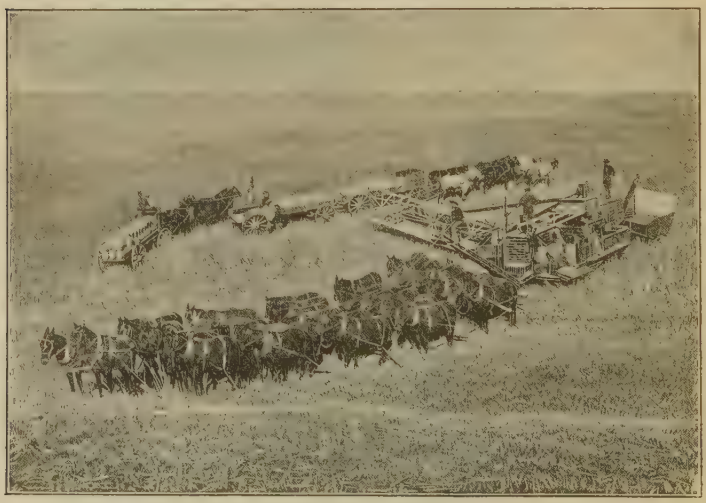
A Grain Drill.

We shall suppose that our visit is made when the wheat is ripe. This time is later than harvest time in the warmer wheat lands farther south. Harvesting on these big farms is a wonderful sight. The wheat is cut by long lines of reaping machines, pulled by horses or mules. The din of the machinery makes us think of a boiler factory. We can hardly hear the voices of the drivers as they yell at their teams.

As we draw nearer, we find that most of the noise comes from the knives which are moving rapidly back and forth a few inches above the ground, and cutting the stalks of grain so that they fall back upon the machine. There is a great reel which pushes the stalks and makes them fall with

their heads all the same way. The reaper is so made that it rolls the stalks together into a bundle or sheaf, and, when the sheaf is just large enough, binds a band of wire or string about it, and throws it off the machine. Behind the machines men walk, and pick up the sheaves and stand them on end in shocks, so that the grain may dry before it is threshed.

Threshing on one of these farms is far different from that of other parts of the world. In some of the wheat lands of Europe the grains are pounded out with a club. In



Combined Harvester and Thresher.

China I have seen boys riding oxen over the straw, as it lay on the hard ground of the threshing floor, in order that the feet of the animals might tread out the grain. In the Red River Valley most of the work is done by threshing machines moved by steam engines. Each thresher will hull out more than one thousand bushels of wheat in a day, thus doing the

work of hundreds of oxen or thousands of clubs or flails. Our threshers separate the grain from the chaff and straw, and the clean wheat flows out through a wooden pipe at the side so fast that it keeps two men busy holding the bags in order that all the grain may be caught. On some of the large farms the work of cutting and threshing is done at the same time by combined harvester and thresher. These great machines are often drawn by steam engines, or by teams of from twenty-five to thirty horses and mules. A single machine with four men will cut and thresh from seventeen hundred to three thousand bushels of wheat in one day.

But how is the wheat cared for after leaving the fields?

This is almost as great a business as raising the wheat. At some of the railroad stations, and at all of our grain ports, there are huge elevators for storing the wheat until it is wanted for sale.

There are many such granaries at Chicago, St. Louis, New York, and New Orleans and elsewhere, and especially at all the large cities upon the Great Lakes. We find many of them at Minneapolis, and learn that single elevators often have storage room for several million bushels of grain. The elevators at Minneapolis alone can hold forty million bushels at one time, and hundreds of train loads of wheat come into the Minneapolis markets in a single year.

Elevators are usually built by the sides of the railroad tracks, and the wheat is taken from the cars directly into them. Each elevator contains great bins, some of which are as high as a six-story house and will hold thousands of bushels of wheat. The grain is moved to the upper parts of the elevator in little buckets of tin or zinc, fastened to a belt, like those which raise the flour in a mill. The wheat is weighed at the top and then poured into the bins. When

A Great Wheat Elevator. This Building will store Seven Million Bushels.

it is taken out, it flows through pipes into the cars or ships which are to carry it to the markets.

There are elevators at the ports at the head of Lake Superior, into which the grain is taken from the cars, and later on poured into the steamers which are to carry it down the Great Lakes to Buffalo, whence it goes through the Erie Canal to New York, to be shipped to Europe. Some grain is loaded on boats and barges and shipped down the Mississippi River; but the greater part goes by

Falls of St. Anthony.

the lakes, as this route is the shortest and cheapest way to the markets of the East.

Minneapolis is a fine city of several hundred thousand inhabitants. It is situated on the Mississippi, at the Falls of St. Anthony, which furnish a water power as great as

could be given by forty thousand horses, all pulling at once. The situation of these falls so near our wheat lands has made Minneapolis the chief milling center of the world. It has many big flour mills which are grinding away day and night. They produce millions of barrels of flour every year, a single mill grinding fifteen thousand barrels in one day.

The mighty Mississippi does a vast amount of work here besides grinding wheat. It runs all kinds of factories. It operates great woolen mills, saws vast quantities of lumber, and moves so much other machinery that Minneapolis has become the manufacturing center of this part of our country.

So close to Minneapolis that the two cities are now almost one is St. Paul, another thriving commercial and manufacturing center. The two towns are called the "Twin Cities of the Northwest." They contain some of the finest business blocks of our country, and in both of them we may ride for miles through well-paved avenues, lined with beautiful houses. The cities almost join, although their business centers are about ten miles apart. We can ride from one to the other in a few minutes on electric or steam railroads.

The growth of these two cities is largely due to their situation in a rich country of forests and farms at the head of navigation of the Mississippi River, close to the Falls of St. Anthony, and to their nearness to the head of navigation of the Great Lakes. Goods may thus be sent from them by water down the Mississippi, or after a short ride of one hundred and fifty miles on the railroad, down the Great Lakes and the St. Lawrence, whence they can be carried to every part of our country, and to the seaports for shipment to Europe.

23. A JOURNEY ON THE GREAT LAKES

A SHORT railroad ride from St. Paul brings us to Duluth, at the head of Lake Superior. The city is built upon the sides of steep and rocky hills about a little harbor at the mouth of the St. Louis River. Bowlders of granite jut out of the ground in almost every lot, and the houses are founded upon the rocks. The streets rise from the wharves in terraces running backward, so that they make us think of the grand stand of a baseball ground. Not far away, to the right as we face the lake, we can see the immense elevators of Superior city; and the many vessels in the harbor show us that we are at the head of the navigation of the Great Lakes.

Look at that steamboat lying under the shadow of the huge wheat elevator down there near the wharves. You have never seen a boat like it before. It resembles an enormous barrel as it lies there in the water, making one think of some sea monster or giant whale. Still, the steam is puffing out of the pipes at its prow, and volumes of black smoke are flowing out of its huge stack at the stern. That is one of the famous whaleback steamships which carry iron ore and grain from Duluth down the Great Lakes. It is now loading wheat. We can see the grain pouring into its hold from the pipes which run down into it from the elevator. Thousands of bushels will be thus stored away within a few hours, and the load it will carry will be more than could be hauled by a train of two-horse wagons ten miles in length.

At the same wharf are other ships which transport thousands of bushels of wheat at a load; and moving about in the harbor are immense grain barges, pulled by smaller

steamers, one little steamboat dragging a long line of bigger boats behind it.

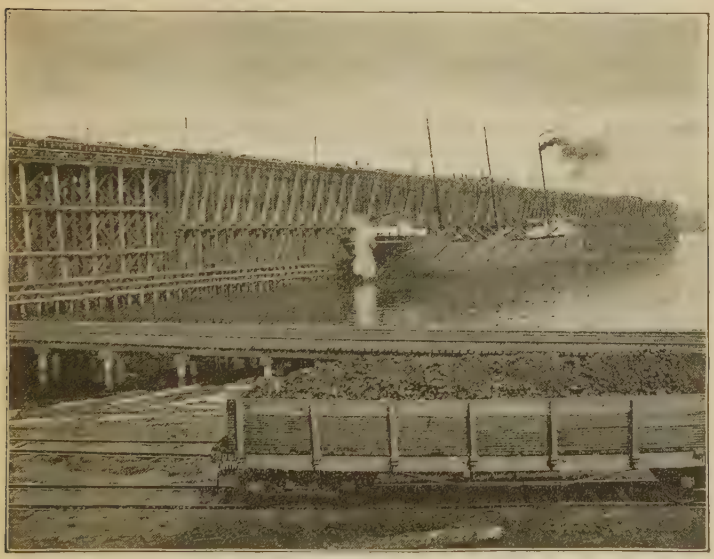
The chain of Great Lakes forms one of the chief commercial highways of the globe. The upper lakes are frozen during the winter, and for five months they are almost as deserted as the icy seas about the north pole. It is only in the seven warmer months that ships can navigate them; but in that time more freight is carried upon them than is brought into Liverpool or London in a whole year.

A Whaleback.

Throughout the summer, day and night, there moves over this great waterway an almost endless fleet of steel steamships, white-winged sailboats, massive barges, monster whalebacks, and magnificent passenger steamers, carrying thousands of people and millions of tons of freight to and fro. There are ships which take nothing but iron ore from the mines about Lake Superior, down to Cleveland, Chicago,

and other ports. There are ships loaded with copper from the mines of the Michigan peninsula, and vast rafts of lumber from the pine forests of the upper lakes.

Were it not for these lakes, it would be far more difficult to transport our immense harvests of grain to the seaboard. That vessel now loading will steam out with its cargo of



Ore Docks at Duluth.

seventy thousand bushels of wheat to Buffalo, or it may even pass through the Welland Canal and go on down through Lake Ontario into the St. Lawrence River, where another ship will carry the grain out across the Atlantic to Europe. There is a navigable waterway from Duluth to the sea, and if the destination of our wheat is Liverpool, it will travel more than half of its voyage in fresh water before it gets to the Atlantic Ocean, at the Strait of Belle Isle.

The journey is made so cheaply that for a few cents a bushel of wheat can be taken to Buffalo, and for thirty cents or less a ton of coal can be brought in the same ship back to Duluth. The cost of transporting goods by water is less than half that of carrying them on the railroads. It is this fact that has caused many towns and cities to spring up at the good harbors along the Great Lakes, and at the channels between them; and it is due to cheap freights that many other cities owe much of their wealth.

But before we go farther, I must tell you a curious thing about the valley or basin in which these vast fresh-water

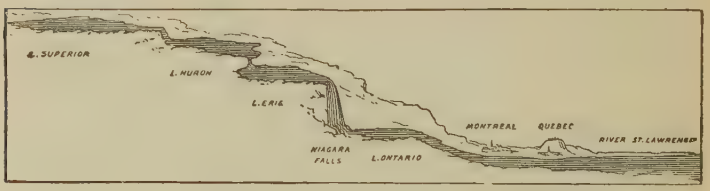


Diagram showing the Lake Terraces.

seas lie. It is situated near the Height of Land, on the crown of the eastern part of our continent, so that on the north just over the rim of the basin the ground slopes toward Hudson Bay, and on the south toward the Gulf of Mexico. The rim of the basin of the Great Lakes is not high, and canals have been cut from Lake Erie south to the Ohio River, so that freight from the Great Lakes can be sent to the Gulf of Mexico. A canal is also being opened from the lower end of Lake Michigan to the Mississippi River, and the Erie Canal takes vast quantities of freight from Lake Erie at Buffalo across New York to the Hudson River, whence it goes down to the Atlantic at New York city. It is said that men can sail in canoes up the streams flowing from the north into Lake Superior, and, by carry-

ing their boats a short distance, can drop them into streams which flow into Hudson Bay.

Another remarkable thing about the basin of the Great Lakes is its shape. It is formed of three terraces, lying one above the other. The top terrace is Lake Superior, the level of which is six hundred feet above the sea. From Lake Superior to the second terrace there is a drop of about twenty feet, and there we find the level of Lakes Huron, Michigan, and Erie. The third drop, by the Falls of Niagara to the level of Lake Ontario, is much greater, and from there the ground slopes down through the valley of the St. Lawrence to the sea.

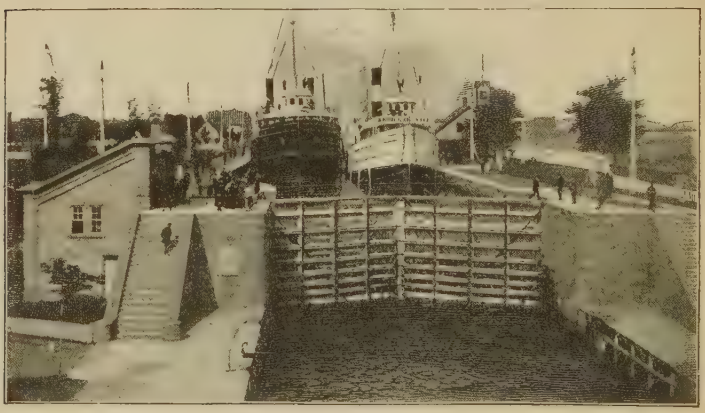
But how do the great ships get from one of these terraces to the other?

They cannot go from Lake Ontario up the swift Niagara River, and climb the falls; nor can they possibly make their way up the raging, rocky rapids of the St. Marys, over which the waters of Lake Superior foam as they rush on toward Lake Huron. No; that is plainly impossible. The vessels must be lifted from one level to another through ship canals. Such canals have been built between Lake Ontario and Lake Erie, and around the Falls of the St. Marys between Lake Huron and Lake Superior. In these canals, by means of locks, the heavy boats are lowered from one terrace to the other. Moreover, they are lowered, step by step, by other locks through other canals, past the rapids of the St. Lawrence, until at last, having dropped from a height greater than that of the Washington Monument, they float on to the Atlantic Ocean. It is by means of the same locks that they climb back again, vessels weighing thousands of tons being lifted up and down.

We shall sail from Lake Superior down into Lake

Huron, and see how this is done. We are on a mighty steamer loaded with iron ore. It is floating on Lake Superior, and must be let down to the level of Lake Huron, which is twenty feet lower.

This will be accomplished while passing through the St. Marys Falls Canal, or, as it is commonly known, the "Soo" Canal, one of the greatest works of its kind in



Lock — St. Marys Falls Canal.

the world. It is about ten miles in length, and it forms a waterway around the rapids of the St. Marys River. Every seven months more than ten thousand vessels pass through it, and by it all are raised or lowered over this step twenty feet high between the two lakes.

We steam for some distance through the canal, until at last we pass between two stone walls as high as a three-story house. They do not seem so high to us, for our ship floats between them on the top of the water, which is now at the level of Lake Superior. We are in the famous lock of the "Soo" Canal. The upper deck of the steamer is far above the walls, and from it we can see, not

far away to the left, the raging St. Marys River, which roars and froths as it tumbles down the rapids.

The water in the lock is as calm as a mill pond. It is held back by two water-tight gates of wood and iron. As our ship comes to rest, we step off upon the walls of the lock, and walk to the gates, over which we can look down into the canal, where it opens into the smooth expanse of the river below the rapids. The water there is twenty feet lower than that in the lock. If the gates were opened, our ship would be hurled down by the great rush of the waters. By means of the lock it will be lowered so gently that, did we shut our eyes, we could hardly tell we were sinking.

How is this done?

The water itself, aided by a steam engine, performs the work. At the entrance of the lock are two gates like those before us. They have been closed by the engine, keeping the waters of Lake Superior back for the time, while at the eastern end of the lock are two other gates which keep the water from flowing out and on to Lake Huron. Our ship is now in a great box of water, whose surface is on the level of Lake Superior. The engineer moves another lever, and holes in the bottom of the box are opened. The water gradually flows out, and the great ship sinks down with it until it is on the level of the canal below. Now the front gates are opened, and we can steam on our way as easily as though there had been no big step to climb down. The waters of St. Marys River for the remaining fifty miles of its course are on the same level as those of Lake Huron.

There are two canals around the St. Marys Falls, one of which is on the Canadian side of the river. There are twenty-six locks in the Welland Ship Canal about Niagara

Falls, for the step from Lake Erie to Lake Ontario is more than fifteen times as high as that between Lakes Huron and Superior. So the ships are lifted up or down a little at a time, until they have passed through that canal, which is twenty-six miles long. There are other locks on the canals about the rapids of the St. Lawrence still lower down, and there are many smaller locks in the Erie Canal between Buffalo and the Hudson River.

24. THE IRON AND COPPER MINES OF LAKE SUPERIOR

BEFORE leaving Lake Superior, we must visit the iron and copper regions which are found not far from its shores. The wealth of the United States is not in its good soil alone.

A vast part of our riches comes from minerals. We are now producing more iron and copper than any other country, and in some years about one half of all the iron manufactured in the world, and more than half of all the copper mined, comes from the United States. For a long time Great Britain was the chief iron- and steel-making nation, but now the United States is far ahead of her and all of the others. We also lead in our production of coal, and it is

The Iron Regions.

our iron and coal which make us the world's chief manufacturing nation. Our supplies of these materials are so vast that the United States must grow richer and richer as they are developed.

No other grand division has such extensive beds of iron ore as North America, although Europe has large mines, and Asia and South America are supposed to contain rich but undeveloped iron regions. Some iron is found in the West Indies, Central America, Mexico, and Canada. In our own country it exists almost everywhere. It is mined in twenty-six different states and territories. There are vast beds of it in Tennessee, Alabama, Virginia, and northwestern Georgia; and Pennsylvania for a long time was our chief source of supply. New York, New Jersey, and Ohio all produce iron, and Texas, Utah, and Wyoming have extensive iron deposits. Our richest beds of this ore, however, are about Lake Superior, and the greater part of our iron now comes from them. Many of our large manufacturing cities rely upon this region for all the iron they use, and a fleet of fast steamers is kept busy carrying the ore down the Great Lakes to the furnaces where it is made into the iron of commerce. The chief article of freight upon the lakes is iron ore; although, as we have seen, wheat, lumber, and other things by the thousands of tons are carried on them.

Iron is never found pure in a state of nature. As it lies in the earth, it is in veins or pockets, walled about with rock, and so mixed with stone that you cannot dig out a piece of iron that is perfectly pure. It is only by melting the ore with limestone, in a peculiar way called smelting, that we can get the iron out of the rock in which it is mixed.

Now smelting requires good coal. But there are no good coal fields within hundreds of miles of Lake Superior.

The iron can be taken to the coal more cheaply than the coal can be brought to the iron. So the heavy ore is carried down through the Great Lakes to Detroit, Toledo, Cleveland, Buffalo, Pittsburgh, Chicago, and other points, to which the coal can be cheaply transported. At these cities the coal and iron are easily brought together, and hence we find them large manufacturing points.

Let me tell you something about these mines of the Lake Superior region. They lie south and west of the lake, in five little ranges of mountains. The best of them are from fifteen to one hundred miles back from the water, on the mountains, about a quarter of a mile higher than the level of the lake. Here there are great steam engines, for pumping the water out of the mines, for hoisting and transporting the ore and for compressing the air which drives the long steel drills into the rocks, so that dynamite candles can be inserted and the huge pieces of ironstone blasted down. In some mines steam shovels are used to strip off the earth and to work some kinds of ore. These shovels load the ore directly upon the cars, and one has loaded at the rate of more than six thousand tons per day. The shovels are each operated by five men, and they work so cheaply that the labor cost of mining is only a few cents per ton.

But suppose we go down into one of these big iron mines. We enter the shaft, and upon a little ore car slide more than a thousand feet down an inclined plane into a network of tunnels. There are electric lights everywhere, and it is almost as bright as day. Now and then we hear the boom! boom! boom! of the blasting going on in other parts of the mine. The sound shakes the air, and we fear lest the walls may fall down. All about us are sooty-faced men, who lift up the great pieces of iron ore and throw

"These shovels load the ore directly upon the cars."

them into little steel cars in which, moved by machinery, they go to the surface.

Now we are again at the top. A car loaded with ore comes close behind us. Let us wait and go with it, and see how the ore is put in the ship. The slope of the railroad from the mines to the lakes is such that the cars run down by their own weight.

The railroad track is built upon a steel trestlework almost a quarter of a mile out into the lake. It is high above the water. Near the end of the trestlework are many big pockets, or bins, into which the ore is dumped from the cars. The bins are so high over the water that the steamers can sail right under them, and the ore is dropped into the holds of the steamers. In this way thousands of tons of iron can be loaded within a few hours.

Our car goes rushing down this track. It thunders out over the trestlework, and we see the red-and-brown ironstone dropped into the bin. As we look, an ore steamer approaches, and a few hours later the iron is on its way to the furnaces. Could we follow it, we should see it dumped out on other great piles of ore, on the wharves of Cleveland or some other lake city. A few days later it will be in an iron foundry, and may come out as a steel rail for one of the trunk lines across the great plains.

It is said that the richest copper mines of Lake Superior were discovered by a pig. These mines are situated in the upper part of Michigan on the Keweenaw Peninsula, which juts out into the lake. This peninsula is barren and rocky. It is not good farming land; but its rich copper beds have caused cities to be built, and there are now thousands of people living there. According to the story, a pig had strayed from the drove to which it belonged, and fallen into a pit. In trying to root its way out, it uncovered

a huge mass of copper, and showed the world the site of one of the best of such mines that had yet been discovered. Vast fortunes have been made out of it, and several thousand men are now at work day and night, getting out the ore which lies buried there.

This is the famous Calumet and Hecla copper mine. It is in a slice of rock varying in width from ten to fifteen feet, going down, down into the earth. The rock is streaked and veined with almost pure copper. Some bits of the ore are so pure that they might almost be hammered into pennies, and one twentieth of the whole mass is copper.

There are many other mines in the Lake Superior region, but none so rich as this. The Red Jacket shaft is almost a mile deep, and they are now working more than a half mile below the surface. Enormous steam engines haul up the steel cars filled with ore mixed with rock, each car holding what would be a load for four horses. The ore is taken from the mines to the stamping mills not far away, and is there crushed into powder, so that the stone can be washed from the copper.

Copper, unlike iron, is often found in a pure state. It seldom combines with other minerals, although silver is sometimes mixed with it. The copper of Lake Superior is often found in solid masses, some of which weigh as much as five hundred tons. Such masses are broken up when possible, and the pieces are put into barrels and shipped down the lakes for smelting.

There are smelting furnaces not far from the mines, and we visit one to see the copper ore turned into bricks. The ore mixed with coal and limestone is put into the furnace, and the intense heat soon causes the whole to become one seething mass. Now a hole at the bottom of the furnace is opened, and a reddish golden stream flows out. How

hot it is! The molten copper is so bright that it dazzles our eyes. It makes us think of the sun when it sets like a great round red ball of fire in the sky.

As the copper flows out of the furnace, it is caught in kettle-like cars and carried, bubbling and blazing, to a set of iron molds of a brick shape fastened to a frame at the edge of a trough full of water. The golden liquid is poured into the molds. It hardens almost as soon as it touches the iron, and the molds are then so turned that the metal, now in the shape of bricks, falls into the trough. The water soon cools the hot copper. Each brick weighs about one hundred and thirty-five pounds. It is about two feet long, six inches wide, and four inches thick. It is the color of a polished copper kettle, and is now ready to be made into wire, or used for the making of brass and bronze and in electrical machines.

Even greater in extent and value than these copper deposits of Lake Superior are those of the Rocky Mountain plateau in certain states of our West. Arizona and Montana now produce more copper than Michigan. Each of these states has mines which are yielding several hundred million pounds every year. Utah and Nevada, and also Alaska, California, New Mexico, Colorado, and Idaho have extensive copper regions, although not so rich as those mentioned above.

25. LIFE IN THE LUMBER REGIONS

OUR travels for the next few days are to be in the woods. Some of our largest forests lie near the Great Lakes, and not many years since we might have traveled about here in any direction for hundreds of miles and seen nothing

but pines and other tall trees. For some time after the United States was discovered, almost all the land between the Atlantic Ocean and the Mississippi River was covered with pines, spruce, hemlock, oaks, maples, beeches, and other trees. There was a vast region of pines which began in Maine and extended to far beyond where we now are,

Lumbering.

and south of that a region of hard woods, which covered almost the whole of our eastern and central states. There were so many trees that no one thought of saving them, and the settlers cut them down as fast as they could to make farms. They piled them up where they fell and burned them. This went on for years, and many thousand square miles of our most valuable forests were wasted.

We have, however, much timber left. Almost one

third of our land is still covered with woods. We have seen some of them during our travels through the pine and cypress regions along the south Atlantic coast and the lower Mississippi. There are trees of other varieties growing in the valleys of the principal rivers, and the forest strip, which is more or less cut here and there, extends on until it is lost in the open plains of western Texas. North of that runs a treeless region once known as the Great Plains, which extends westward to the foot of the Rocky Mountains.

On the Rocky Mountain plateau are many fine trees; and west of it is the great Pacific coast forest, said to be the most densely timbered region on earth. As we travel through California, we shall see some of this forest in the big trees, which are taller and thicker than any others known to man; and in that state and in Oregon and Washington, shall travel through the monster redwoods so tall that they seem almost to reach the sky.

In all these forest regions the trees are rapidly falling. Within the past generation, the United States government forest inspectors estimate that enough have been cut to make a floor an inch thick over the states of Vermont, Massachusetts, Connecticut, Rhode Island, and Delaware; and our Bureau of Forestry tells us that if more trees are not planted, and this cutting goes on at the same rate as now, within not many years our forests will all disappear.

The thought makes us tremble, and we wonder how in the world we could get on without wood. It forms the greater part of our houses, and the most of our furniture. It bridges our rivers and timbers our mines, and holds fast the railroad tracks, for which alone we consume every year more than one hundred million ties. Wood is used largely in car and ship building. Ground to a pulp, it

makes the paper which covers the walls of our houses, and also that of our daily journals and magazines, and even of this book we are reading. There are so many uses of wood that we cannot mention them all.

Moreover, there is another value our forests possess. They cover the hills and mountains, and their roots act like so many sponges to keep the water flow steady. When cut away, the water that falls as rain rushes down all at once, carrying the soil into the streams and destroying the fertility of the land.

For these reasons our government is advising the people everywhere to plant trees, and it has set aside almost two hundred million acres of woodlands in various parts of the United States as national forests. These forests are scattered over our western country from Alaska to Mexico, and are located mostly on the great western plateau and in the Pacific coast states. In addition, some of the states are reserving large tracts, the trees upon which may not be cut except in such a way as will not injure the forests.

As we proceed with our travels, we shall observe for ourselves how necessary it is to improve our lumber resources by replanting the trees and by seeing that they are not wasted. The industry of getting out the lumber alone employs several hundred thousand men, to whom are paid wages of more than one hundred million dollars a year, the product being annually worth many times that amount. Right here about Lake Superior the forests are still so dense that one might get lost in them, and travel for weeks without finding his way out.

As we sailed up the Mississippi from St. Louis to St. Paul, we passed thousands of logs floating down toward the Gulf of Mexico. They had come from the forests of Minnesota and Wisconsin, had been hauled over the snow

to the rivers and smaller streams which flow into the Mississippi, and were on their way to the markets. As we go on down through the Great Lakes, we shall meet other log rafts towed by steamers; and at many of the ports shall hear the scream of the gang-and-band saws as they cut the logs into boards.

Lumbering in the Great Lakes region can be carried on best when the snow is on the ground. The felling of the trees is by men who go into the woods in the fall and remain there all winter. They build big log cabins, filling the cracks between the logs with mud and sod. Often fifty men will live in one large cabin. They sleep in bunks, built along the walls, and eat at a common table, using tin plates and other dishes which will not easily break. They take enough provisions with them to last all winter, and the bill of fare of pork and beans, canned meats, and hot bread is often varied by a venison stew or bear steak from game shot upon the ground.

In chopping, everything is done according to system. A man known as the underchopper first goes through the forest and marks those trees which will make the best lumber. Then come the sawyers and choppers who fell the trees. They first make a cut about each tree with a long saw, which is pulled back and forth by two men at the ends. Then the men with the axes chop above and beyond the saw cut until at last the giant of the forest falls with a crash to the ground. The limbs must now be trimmed off and the tree sawed into logs.

The next thing is to get the logs to the stream. This is done on sledges, pulled by two or more horses over a road of snow or ice. Such roads are so slippery that the horses can haul over them many times as much as they could on a common road with a wagon. Sometimes a load of logs big

enough to fill an ordinary bedroom from floor to ceiling is thus carried down to the river. The first thing is making the road. After the snow has been well beaten down, a sprinkling machine is used; and the water, freezing as it

A Big Load of Logs.

falls, forms a wide path of ice, over which the heavy logs can be easily hauled.

The streams of this region are frozen most of the winter, and the logs are rolled off upon the ice, so that for a long distance the whole stream is bridged with them. The ice is several feet thick, and does not break under the great weight.

In the spring the thaws come, the streams rise, and the freshets which follow carry the logs down to the lakes, or to the Mississippi or other rivers.

Several men go with each "drive" of logs, in order to keep it moving and to prevent the logs from being scattered. The men are always watching to see that no logs lodge on stones or against the banks, for then those coming behind would be stopped and cause a jam. The men jump from log to log; and in order to give them a sure footing the soles of their boots are covered with sharp nails. They have long poles which end in hooks and spikes, and with them they push and pull the logs this way and that. When a jam occurs, the logs pile one on top of another, and act more like animals than wood. Some dive under the jam, some stand on end against it, and others climb upon the top. After a while they become so wedged together that one would think they could not be taken apart. The logger, however, goes with his pike to the front of the jam, and inch by inch pulls out the logs forming the keystone, as it were, and then the whole mass comes tumbling down into the river.

A "Drive" of Logs.

Every gang of loggers has its own cook, who calls the men to meals by blowing upon a tin horn. Sometimes cabins are built upon rafts, which are floated down the river behind the logs, and in such cabins the cooking is done, and there the men sleep at night.

In others of our lumber regions the logs are carried to the streams upon railroads, and they are sometimes loaded by a steam engine, to which is fastened a rope of steel as thick as a broom handle and a mile or more long. This

rope is wrapped about a log as it lies in the forest. The engine is then started, and it winds up the rope, thus dragging the log to the cars.

Lake Michigan has many sawmills upon its shores, in which logs are cut into lumber ready to be shipped on boats down the lakes. Some of the mills have what are known as gang saws, a number of saws moving up and down through a log, cutting the whole into boards at one time. Others use the band saw, a wide belt of steel with teeth on one edge. This moves like a band of leather upon two great wheels, one high above the other. As the steel belt runs round, the teeth in the front of it saw through the logs, so that boards are thus made faster than even the gang saws can cut them.

In all of these establishments a large part of the refuse is turned into shingles; the bark and sawdust are used for fuel, and all is so managed that hardly a particle of the tree goes to waste.

26. OUR GREAT CITIES ON THE LAKES

AS we steam on down to Buffalo through Lake Superior, Lake Huron, and Lake Erie, we stop at some of the large cities which have risen upon their shores because of the cheap transportation they give to manufacturing and commerce. As we leave Lake Huron and sail through the green expanse known as the St. Clair Flats into the narrow Detroit River, we pass some ships carrying lumber and iron to the eastward and others loaded with coal going west. During the open-lake season the vessels in this river are so many that they form a great caravan of

steamers which moves along day and night. Thirty or forty thousand vessels pass through every year on their way to and from Lakes Erie and Huron, and they carry sixty or seventy million tons of freight in that time. The commerce is so great that on the average a vessel of some kind passes the city of Detroit every seven and a half minutes during the season.

Detroit is the largest city of Michigan. It lies on the west bank of the river at a natural crossing between Canada and the United States, so that it has become a center of trade between the two countries. Moreover, it is so situated that goods can be shipped from it by rail and water to all parts of our Union. We therefore find here large wholesale establishments; and on account of the cheap coal, wood, and iron, car shops, foundries, steel works, and factories for making furniture and other things out of wood. Detroit produces automobiles and carriages, candies and drugs, as well as many of the stoves which we use for cooking and warming our houses.

The city has beautiful residences, and we enjoy our walks through Woodward and Jefferson avenues under the shade of their magnificent maples and elms. We take the ferry and cross over the river to Windsor in Canada to see how it feels to have one's feet on foreign soil; and then return to complete our travels in the United States before making further explorations of that country.

From Detroit it is but a few hours' ride to Toledo, a large and prosperous city at the western end of Lake Erie. Farther on, about the middle of the southern shore of that lake, is the great port of Cleveland, celebrated for its manufactures of coal oil, iron, ships for the lake trade, and all kinds of machinery. The city is situated at the mouth of the Cuyahoga River, and as we sail in we pass enormous

docks piled high with iron ore brought down from Lake Superior.

Cleveland is one of the chief iron-ore markets of the world. The mines we have visited along Lake Superior were largely developed by Cleveland men, and many of the steamers which carry the ore down the lakes are built in Cleveland. The rich coal fields of Ohio and Pennsylvania are not far from this point, and therefore we see that Cleveland can easily have the cheap coal and iron, which, to-

A Park Scene in Cleveland.

gether with its water transportation, help so much to make it a thriving manufacturing center.

We take a walk through the city, stopping for a moment upon the great stone viaduct which crosses the Cuyahoga River, uniting the east and west sides, and then go on into Superior Street and visit the chief business sections.

We stop in a beautiful park in the center of the city to

take a look at the bronze statue of Captain Perry, representing him when he so bravely charged and captured the British squadron on Lake Erie, in the War of 1812. Perry was only twenty-seven years old at that time. The British expected an easy victory, but he defeated them; and in sending the news of his triumph to General William Henry Harrison, he used the historic words: —

"We have met the enemy, and they are ours."

A walk along Euclid Avenue shows us one of the finest streets of the world. The residences are of stone, wood, and brick, and of all styles of architecture. The chief beauty of the street, however, lies in the velvety lawns and the old forest trees upon them, which make the whole look like a great park.

Tomb of President Garfield.

We next visit the cemetery near the lake to see the marble monument under which President Garfield lies buried. Then, coming back to the wharf, we continue our trip to Buffalo.

Our huge steamer moves smoothly and majestically over the waves. Shortly after leaving, we go to bed in our cabins, and awake next morning to find ourselves in front of the city of Buffalo. Buffalo is situated at the east end of Lake Erie, at the mouth of Buffalo Creek. It is at the head of Niagara River and about twenty miles above Niagara Falls. Its name is supposed to come from the herds

of buffaloes which once used this creek as a watering place. The city lies at the chief gateway between the sea and the vast regions of the upper lakes. Not far from it is the head of the Welland Canal, which connects Lake Erie with Lake Ontario and the St. Lawrence; and the Erie Canal, which has its terminus at Buffalo, connects the lakes with the great ocean commerce which comes here by way of New

The Harbor at Buffalo.

York and the Hudson River. These waterways have so cheapened the carrying of freight to the interior of our country that Buffalo has become a great port.

It is wonderful how a new waterway sometimes changes the commerce of a country. The digging of the Erie Canal aided in making New York the greatest city of the United States. Before the canal was built, it was cheaper to send

freight across the mountains to Pittsburgh. It then took twenty days, and cost one hundred dollars a ton to carry goods from Buffalo to New York. When the canal was finished, it cost only fourteen dollars a ton; and now the freights have been so reduced that one can send things from New York to Buffalo for a dollar a ton, and some goods cost less than fifty cents a ton.

Before the canal was built, wheat was an expensive article in the eastern states. In some places wheat bread was a luxury, and not to be used as a common food. Rye flour and corn meal made from grain raised in those localities were used instead of wheat flour. It is through cheap transportation that we are now able to get our flour at low prices.

How would you like to carry a bushel of wheat hundreds of miles for two cents? It now costs only about two cents to transport a bushel of wheat from Buffalo to New York by way of the Erie Canal, and the freight rates on the Great Lakes above are so low that the wheat we saw loaded in Duluth will be landed in Buffalo for something like three cents a bushel; so that it costs less than ten cents a bushel to bring grain from the Red River Valley to New York. The freight on flour is also cheap, and the bread we shall eat at our dinner to-day in Buffalo was probably made of flour that came here more than a thousand miles on the lakes.

The freight on iron ore from the mines of Lake Superior to Buffalo is only a fraction of a cent a pound, while the ore steamers returning will carry coal back to Duluth for from fifteen to thirty cents a ton. A ton of coal is a good wagonload for two horses over a country road. Think of taking a wagonload of stuff from Buffalo to Duluth for fifteen cents, and you can see how cheaply goods are now

A Freight Ship of the Great Lakes. The rate on iron is often less than one half cent a pound.

carried from one part of our land to another by means of the lakes.

With such advantages, what should we expect to find at Buffalo?

We should look for grain elevators for storing this wheat until it can be transferred to the boats on the canal. Well, Buffalo has more than fifty such elevators, and it is one of the chief grain-shipping ports of the world. We should also expect to find flour mills. Buffalo has so many that they grind out more than a million barrels of flour every year. Moreover, there are rich coal fields in New York and Pennsylvania, not far to the southward, and we therefore see vast trestles for loading hard and soft coal upon the steamers. Near them are the iron-ore docks; and not far away are machine shops, foundries, and factories, in which are made many kinds of merchandise and which employ more than a hundred thousand persons. The cheap electric power produced at Niagara Falls near by adds greatly to the manufacturing facilities of the city; and therefore Buffalo is growing fast in industry and wealth.

27. A VISIT TO NIAGARA FALLS

NIAGARA FALLS is only a few miles from Buffalo. We can go by the steam railroad and reach it in half an hour, or we can ride there on an electric car, which takes longer. The trolley cars carry us for miles along the Niagara River below the falls, and from them we can see the deep gorge through which the river runs, boiling and seething after its great tumble, on its way to Lake Ontario.

The Niagara is a wonderful river. Its waters have their source in Lake Superior, and we have seen how they flow out of that great basin, through the St. Marys River, to the level of Lake Huron. It was by means of the huge

Niagara Falls.

locks at the St. Marys Canal that we were lowered down the twenty-foot step which lies between those two lakes. We could not notice that we were going downhill as we sailed on through the Detroit River and across Lake Erie

to Buffalo, for the descent from the foot of the St. Marys Canal to the head of the Niagara River is slight.

Here, however, the mighty waters are poured from the Erie basin into that of Lake Ontario, which lies three hundred and thirty feet below. The Niagara River is the great down spout through which they run. It is only thirty-three miles long, and it makes more than half of its descent in one jump at Niagara Falls.

The volume of water which flows between the banks of the Niagara is so great that every minute more than half a million tons are dropped over the falls; and the force with which this water descends is estimated to be greater than that of all the steam engines of our country working together.

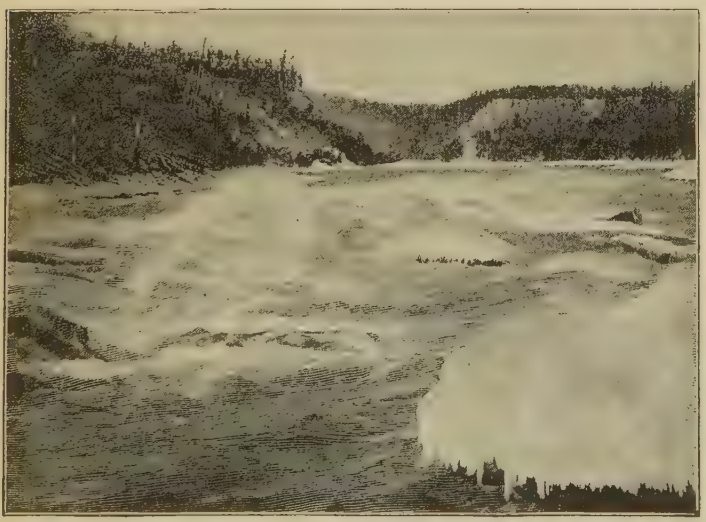
The course of the Niagara, as it runs from Lake Erie to Lake Ontario, is nearly due north. Where it flows out of Lake Erie, the stream is almost as quiet as a mill pond, and the fall is not more than a foot to the mile. Shortly after leaving Lake Erie, however, the river divides and passes round Grand Island. At the lower end of that island it is more than a mile broad. It is still quiet, and it moves slowly on down, until it comes to within a mile of the falls.

Then it grows narrower, the rapids begin, and one sees the waters boiling as they sweep among rocks and about islands. They seem to be rousing themselves for their great jump. They foam as they dash about Goat Island, on the edge of the falls, and then take the hundred-and-sixty-foot leap downward into the great abyss below.

For the next seven miles the river flows through a ravine, the banks of which rise two hundred to three hundred feet almost straight upward above the water. As the river rushes between the banks, it seems to give out mighty sighs. Its

waters are churned about in whirlpools. They seethe and foam until they pass Lewiston, at the end of the gorge, when they suddenly become quiet and flow peacefully on into Lake Ontario.

Our trolley car carries us to the thriving town of Niagara Falls, which has grown up for the accommodation of the thousands of tourists who come here every season. Near by



Whirlpool and Rapids.

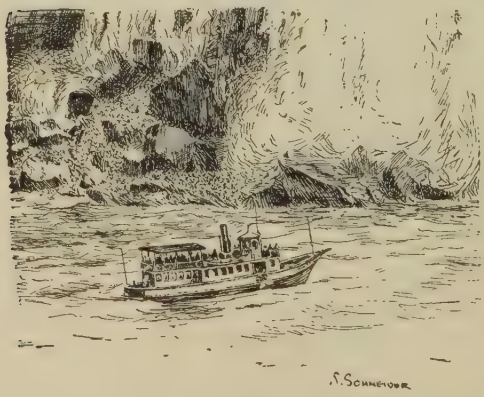
is the State Reservation, surrounding the American side of the falls, and corresponding to it is Queen Victoria Park, which the Canadians have established on the opposite bank of the river.

In former times much complaint was made of the extortion which the hack drivers and guides practiced at Niagara. Now everything is regulated by law, and we find we can make the trip cheaply. There are coaches which take us across the suspension bridge and give us a tour of the islands

and to all the points of interest about the falls. Our round-trip tickets cost only twenty-five cents, and we have the right to stop and wait for other coaches at the interesting places.

We first drive to Goat Island to see how the falls are divided by this high patch of green. On our right are the American Falls, as high but not so wide as the Horseshoe Falls, which extend, in the shape of a great crescent, to the shores of Canada on our left.

What a thick mist rises from the water! How the river thunders as it dashes over the rocks! The noise is so great that it can be heard forty miles away. The waters sparkle as they fall. They bubble and seethe and foam in angry motion in their bed below us. Now the sun comes out from behind a cloud. It darts its rays into the mist, and paints rainbows there. The rainbows change as we look, and new rainbows appear as the water spurts upward in a diamond spray.



Maid of the Mist.

We tarry awhile on the bridge above the falls, and a little later go to the Cave of the Winds. This cave is right under the falls, and we must have a costume and a guide before we can undertake the journey. We can get both for a dollar. We put on rubber coats and caps, and rude pantaloons or bloomers. Our feet are shod with felt slippers,

in order that we may not slip, for the descent is somewhat dangerous. Our guides take us down a wooden staircase along the rocks, until at last we are right under the splashing torrent, and as we go into the cave the noise almost deafens us. While we stand there and look out, the sun peeps in through the spray, and we have a curtain of rainbows.

Another thrilling experience is our ride under the falls in the *Maid of the Mist*. This little steamboat has powerful machinery, which carries it in and out among the rocks through the boiling waters from one side of the river to the other.

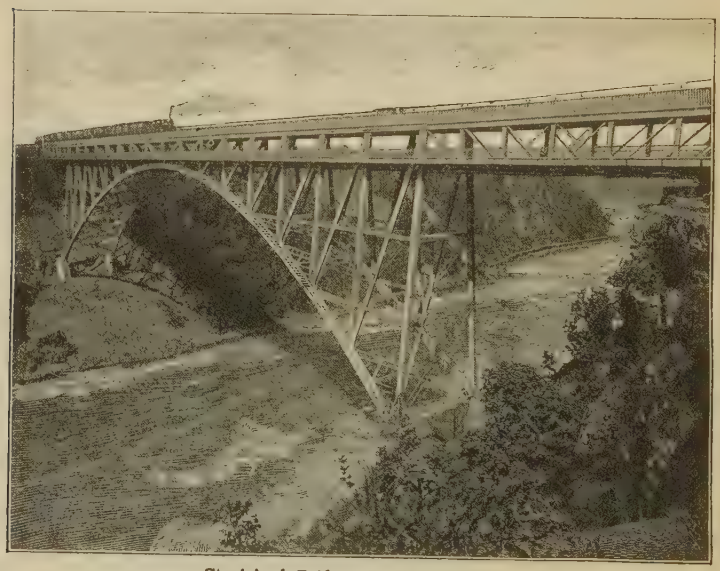
We also visit the whirlpool and the rapids above it; and then take a walk over the great steel arch bridge which here connects Canada with the United States. From it we get another fine view of the falls.

The bridge itself is a wonder. It crosses right over the raging Niagara River. It is a mighty arch of steel, with a span said to be the largest of its kind in the world. Its approaches are two hundred and ninety feet long, and on its top are two tracks for railroads, and below are wagonways, sidewalks, and trolley-car tracks.

The first suspension bridge was put across this gorge more than half a century ago, and it is interesting to know how boys aided in its construction. A civil engineer, Mr. Charles Ellet, had planned the bridge. He wished to get a line from one side to the other; so he offered a reward of five dollars to any one who could throw a string across the chasm. The next windy day, scores of boys with kites in their hands were on the American bank of the river, and before night a lucky youth had landed his kite on the opposite side, and secured the reward.

To his kite string a strong cord was now fastened, and

this was pulled from one side to the other. Then, by means of the cord, a rope was drawn over and a cable made of wires about as thick as a man's thumb was tied to it. When the cable had been drawn across, its ends were fastened to wooden scaffolds built upon each side of the river. An iron basket with pulley attached was then hung on the cable, so that the workmen in it could be drawn



Steel Arch Bridge across the Niagara.

from one side to the other. Mr. Ellet was the first man to go over in the basket, and his trip created a great sensation.

Soon after this, huge stone towers were built, heavy cables were carried across from one bank to the other, and little by little the suspension bridge was made. At first people would not trust themselves upon the bridge; but

after Mr. Ellet had driven a team of horses over it, they lost their fear, and it came into general use. A few years later the first railroad suspension bridge was made, and now we have the magnificent structure upon which we cross to-day.

Other wonderful engineering works are those connected with the tunnels which have been built to harness Niagara Falls and make its immense water power labor for man. One of these begins on the American side a mile and a quarter above the falls, and extends to beyond the steel bridge below them. It is a tunnel eighteen feet wide and twenty-one feet high cut through the solid rock in such a way that the water rushes through it with a force equal to that of more than a hundred thousand horses. In the tunnel, pits have been sunk in which huge turbine wheels have been erected, and which are driven round and round by the force of the water as it falls upon them. Connected with the wheels are dynamos for the generation of electricity; and the machinery is such that each wheel exerts as much force as five thousand horses all working at once.

On the opposite side of the falls the Canadians are using the water power in much the same manner by means of an immense steel flume, eighteen feet in diameter, which runs below Queen Victoria Park, carrying enough water to produce many thousand horse power. In this way the falls are now doing the work of several hundred thousand horses; and it is estimated that if their water power were all used it would equal more than seven million horse power, an amount so great we cannot conceive it.

The electricity thus produced is employed to run many factories near the falls. Some of it goes through wires to Buffalo to furnish power there, and some to light and run

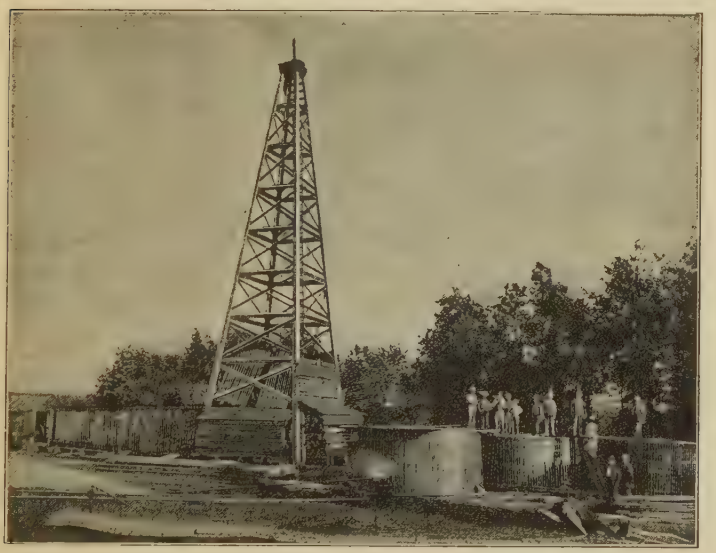
the street cars of cities and towns which are several hours distant by rail. Many think that this water power will cause a gigantic manufacturing city to spring up about the falls; and that by means of wires it may sometime be carried as far as Chicago and New York, so that the Niagara River will be doing the work of a hundred cities or more.

28. TRAVELS IN THE OIL REGIONS

WE shall visit to-day some of the oil fields of the United States. There are parts of our country under which lie vast beds of porous rock, filled with petroleum or coal oil. Petroleum is a name made from two Greek words meaning rock oil. This oil was known to the Greeks, Romans, and Persians in ancient times, but was never used to any extent until it was discovered in great quantities in our own country a little more than a half century ago. To-day there are a number of oil fields in different parts of the world; but the only ones that compare with those of the United States are in Mexico and a region about the Caspian Sea, where for ages petroleum has been known to exist, but where it has been worked commercially only since the oil discoveries of this territory we are about to explore. Here in northwest Pennsylvania and southwest New York, not far from Buffalo, on the western plateau of the Appalachian Mountains, is a country which gave the first coal oil to commerce, and which is still lighting many millions of homes.

We see signs of petroleum soon after leaving Buffalo. Long railroad trains, carrying huge iron cylinders filled

with petroleum, fly past us; and on both sides of the track are derricks, tall wooden frames built up above the earth, for drilling the wells or raising the oil to the surface. In many places are vast tanks of iron used for storing petroleum, each of which holds twenty-five or thirty thousand barrels. The ground is covered with a network of iron



Oil Derrick and Tanks.

pipes which carry the oil here and there. The air is filled with the smell of petroleum. The very earth seems greasy, and the streams are coated with a steel-blue scum.

We stop at Titusville, Pennsylvania, where in August, 1858, the first well was sunk. Before that, no one knew that there were enormous quantities of coal oil underground. The light of the world came chiefly from candles of tallow or wax, or little wicks floating in saucers of lard or sperm oil. This was so even in the oil regions, notwithstanding

little pools of petroleum lay here and there upon the surface of the ground.

Petroleum was then called rock oil, and the Indians laid cloths on these pools or upon the ground and soaked it up to use it for medicine. It was supposed to be good for rheumatism and sore throat, and to make the hair grow. The farmers thought it injured the land, and it is said that one man sold out and moved off to Canada because the oil came out upon the ponds and spoiled the drinking water for his cattle. After oil was discovered, that farm brought a fortune to its owner.

Drake, the man who bored the first well near Titusville, thought that if there was so much oil on the top of the ground, there must be much more below, so he drilled down into the earth for it. At sixty-nine feet he struck oil, and the greasy fluid came forth at the rate of thirty-five barrels a day. When this was reported in other parts of the country, no one believed it to be true. But later more wells were sunk, and more oil was the result. It was soon found that the real source of the petroleum was much deeper than sixty-nine feet, the best wells being those which went down from thirteen hundred to two thousand and more feet into the ground.

It is difficult to bore such deep holes through the rock. Derricks must be erected to hold the long steel drilling tools, which are so heavy that it would take two horses to haul a set of them. Steam engines are placed beside the derricks, and they keep raising and dropping the heavy drills upon the rock until a hole is cut down into the earth a quarter of a mile or more.

When the oil is struck, a torpedo of nitroglycerin is put into the bottom of the well and exploded to enlarge the hole; and the oil sometimes gushes forth at the rate of

hundreds and even thousands of barrels a day. From some wells it has to be pumped; from others it flows freely for a long time without pumping.

Petroleum was thought to be of but little value at the start. Some of the first wells were sunk simply for the novelty of seeing the oil spout up into the air, and tens of thousands of barrels of crude petroleum were allowed to

A Burning Oil Well.

flow into the creeks and rivers; for no one had yet learned how to utilize it. It was not long, however, before some one discovered a method of refining it and thus removing its impurities. Then it was found that by the use of chimneys, properly made, the refined oil could be burned in lamps, giving no smoke, and making a much better light than any other oil so far known.

Little by little the value of petroleum for other purposes became appreciated. It is now used for making gasoline and illuminating gas; and a great deal is manufactured

into lubricating oils for running machinery, some into benzine, which is employed in making India rubber and rubber goods. Out of the refuse of the refineries come vaseline and other things, such as chewing gum, which is so largely consumed in our country. Indeed, it is said that two hundred important products are made from petroleum. Its principal use, however, is for lighting; and in that it has superseded all other oils. The refined oil is called kerosene.

Within a few years after Captain Drake's discovery, this region where we are now was filled with men from all parts of the world who had come here to make their fortunes. Cities grew up in different parts of it, and a vast industry was founded to get out the petroleum and prepare it for the markets. Since then other large oil fields have been discovered in West Virginia, Ohio, Indiana, Kansas, Oklahoma, Texas, Louisiana, and California, and we now produce at times over two hundred million barrels of petroleum a year. This is enough to give four gallons to every one upon earth and leave some to spare. We produce more than half of all the petroleum used by man, and far more than any other country, our chief competitors being Russia, Mexico, Austria, Roumania, Germany, and Canada, as well as Burma, India, and Japan, and the islands of Java, Sumatra, and Borneo.

The money that annually comes from this product amounts to many millions of dollars, and that which we receive for it from abroad is greater than from any of our other exports except cotton, breadstuffs and provisions, and manufactures of copper and of iron and steel. Our kerosene is now used by the people of every continent, and it goes to all parts of the world. It is carried by camels over the deserts of Africa and Asia and by llamas through the passes of the Andes. I have watched Chinese pushing it in cans upon

wheelbarrows through the streets of Peking, and have seen the Hindus lighting their huts with it on the banks of the Ganges.

Great tank steamers have been built for carrying our kerosene over the seas, and most of such exports now go in that way. The steamers are made entirely of iron; and when loaded, the body of the vessel is filled with this liquid. When the steamer comes to the wharves of a far-away land, the oil is pumped out by machinery into huge tanks, many thousand gallons being unloaded in one day.

In our own country iron pipes have been so laid that the petroleum can be pumped from the oil fields over the mountains and through the valleys to Cleveland, Baltimore, Philadelphia, New York, and other places where there are refineries in which it is prepared for use. There are also pipes running from the refineries to the railroads and steamers. The pipe lines connect the oil regions with other great cities, so that by turning a valve the oil can be let out through a pipe into almost any market desired. A similar network of pipe lines has been laid for our oil regions in Oklahoma, Texas, California, and other places; and the oil pipes of the United States are so many that if they were placed in one line they would encircle the world.

In going about through the oil territory we are warned not to light matches. The flowing wells may ignite or the tanks of petroleum explode, when the oil will run over the country in rivers of flames. A huge tank near Oil City, Pennsylvania, once caught fire, covering the waters of Oil Creek with blazing petroleum and causing the loss of many lives.

As we go on through the oil fields, we frequently pass towns whose streets at first seem to be filled with torchlight processions. A second look shows us that the torches are stationary, and that each is a round black pipe, out of which

comes a waving flame of fire. That flame is produced by natural gas which flows forth from the depths of the earth. It comes from huge gas reservoirs made by nature, hundreds of feet below the surface of the ground. Such reservoirs are common to the oil regions, where the gas and oil are often found close together.

Men drill for gas much as they do for oil. They bore holes into the earth with drilling tools, going down one or two thousand feet before they get through the hard rock which forms the heavy, tight roof to the porous rock in which the gas is stored.

When the latter is struck, the gas rushes out with great force. It carries water and stone with it at first, and a pipe is driven down into the well to keep the water from flowing in. After this the gas comes out of the top of the pipe so fast that in a good well it is impossible to strike the mouth of the pipe with a sledge hammer. The hammer falls upon the stream of gas as though upon a rubber cushion, and the gas throws it up from the pipe. Hurl a baseball club into the stream. It will be thrown eighty feet or more into the air, and as it descends into the stream of gas it will be lifted again and again, until at last, coming outside the current, it will drop to the ground.

I have tried to strike the top of the two-inch pipe of a small gas well. The gas stream threw my hammer upward again and again, and I could not pound the iron. The gas coming out of that little pipe made a noise which was almost deafening. It was of a bluish color, and upon putting my fingers into it, I found it as cold as ice.

Near Findlay, in western Ohio, I was once shown the wonderful force of the great Karg Well, which was then flowing twelve million cubic feet of gas a day. A pipe four inches in diameter had been run out from the well

above the banks of a little river. A match was held in front of the pipe, and a lever so turned that the gas came slowly out. It was lighted, and at first it formed what seemed like a bonfire hanging above the water. As the pipe was gradually opened, the flame increased, until at last the gas poured forth with a roar like that of Niagara. The flame spread out in a great sheet from thirty to forty feet long. It hung over the rapid-running water, making it so warm that clouds of steam rose up and touched the flame. As the gas came forth, the noise shook the earth, the heavy iron pipe quivered, and the air was so hot as to be almost unendurable. Still the mouth of the pipe was cold, the rush of the gas being so great that it blew the fire five feet away from it.

A Burning Gas Well.

I threw blocks of wood and pieces of stone into the gas, and saw them carried far out over the river. The sheet of flame was steady, and the noise continued until a valve, which moved so gently that a boy could operate it, was turned and the gas shut off.

The gas is used as a fuel for manufacturing and also for lighting and heating houses. In such homes there is no wood to cut, no coal to carry, and no ashes to take out. The fires are made by dropping pieces of lighted paper into

the stoves, and a twist of the finger turns the valve that lets in the gas. A turn the other way, and your fire is out; or if you wish it, it will burn all day and all night.

Gas is often burned in grates, the jets coming out of sheets of asbestos which are so roughened that as the flame plays over them they look like frosted gold. In some grates pieces of broken rock are thrown; the burning gas makes them look red-hot, and you have what seems to be blazing coals. In the fireplaces they have logs made of clay in which holes are punched, so that when the gas is lighted they remind one of burning wood; and in the kitchen stoves sticks of artificial wood take the place of the real article.

Natural gas has an enormous heating power, and we shall see it used in the furnaces of Pittsburgh, where it is employed in making glass and for some of the processes of iron manufacture.

As our train carries us on down the valley of the Allegheny River, we pass many factories where the gas is used. Such institutions are more numerous as we go on, and at last there seem to be machine shops everywhere. Surrounding almost every town and scattered through it, is a forest of smokestacks, from which, as the evening shades fall, the flames rise, lighting up the country for miles around, and making a scene which is weird, ghostlike, and almost terrible.

We are now nearing one of the chief manufacturing centers of the United States. We are in the suburbs of the smoky city of Pittsburgh, where thousands of men are busy day and night making iron, steel, and hundreds of the various products which come from them.

29. TRAVELS IN THE COAL REGIONS

HAVE you ever thought what strange things there are away down under the ground?

We saw some of them when we visited the copper and iron mines of Lake Superior, and others in the natural gas and oil fields, and to-day we are to examine something which is even more wonderful. It is an article we use every day, and which we could not well get along without.

It is coal.

Have you ever thought what a wonderful thing coal is?

Take up a lump of the dirty black stuff and look at it. Can you realize that that lump was once plants and vegetables; that it was growing ages and ages ago; and that, having been covered over with earth and stone, it finally hardened and turned into coal? Coal, coal oil, and natural gas, with respect to one another, might be called cousins. It is thought that all were made in about the same way; and they are, as you know, of much the same nature.

The Coal Regions.

Men lived for thousands of years upon the earth before they learned that coal was good to burn. All the iron used before the days of the middle ages was smelted from the ore with charcoal. A mythical tale is told of how a Belgian blacksmith discovered that stone coal was good for iron making. This blacksmith was a poor man. He had to make the charcoal which he used in his forge, but

it took so much time that he found that, hard as he might work, he was not able to earn enough money to keep his family. At last, in despair, he was about to kill himself, when a white-bearded old man appeared at his shop, and told him to go to the mountains near by and dig out the black earth and burn it. He did so, and was able to make a horseshoe at one forging. This is the Belgian story of the discovery of coal.

The first coal found in America was near Ottawa, Illinois. It was discovered by Father Hennepin, a French explorer who traveled through that part of our country in 1679.

It was near Richmond, Virginia, that the first coal mines of the United States were worked. That coal region was discovered by a boy who was fishing. While hunting for crabs for bait in a small creek, he stumbled on the outcroppings of the James River coal beds.

Coal is of different kinds. Bituminous or soft coal can be broken without trouble, and some of it burns so easily that a lump can be lighted with a match. Anthracite coal is almost as hard as stone, and difficult to break. It was a long time after soft coal was used before people discovered that anthracite coal would burn, but it now forms a large part of our fuel. There is a little anthracite-coal region in northeastern Pennsylvania, about Wilkesbarre and Scranton, within two hundred miles of New York city, and one hundred and twenty miles of Philadelphia, which produces every year coal that sells for more than the annual product of all the gold mines of the United States. It is the richest coal field of the world. More than seventy million tons of hard coal are taken out of it every year, and the mining has been going on since the oldest of our grandfathers were babies.

These coal fields are said to have been found by Nicho

Allen, when George Washington was President of the United States. Allen was a hunter. One night he encamped in this region, building a wood fire upon some black stones. After dinner he lay down by the fire and went to sleep. He awoke to find himself almost roasted. The stones were on fire, and Pennsylvania anthracite was burning for the first time.

Shortly after that a company was formed to sell the new coal. Some of it was shipped to Philadelphia; but the people did not know how to use it, and could not make it burn. It was unpopular, and those who had bought it thought they had been cheated. Some of them finally got

A Coal Breaker.

a writ from the city authorities denouncing the men who sold anthracite as knaves and scoundrels for trying to impose rocks upon the people for coal.

Anthracite coal as it comes out of the mines contains

great quantities of stone, slate, and dust. It has to be broken up and picked over before it can be used. This is done in what is known as a coal breaker, a building almost as big as one of the grain elevators we saw at Duluth. The coal is taken to the top, and the lumps are separated by machinery into different sizes. They are then run through inclined troughs, or chutes, and boys who are paid about fifty cents a day pick out the slate and other rubbish as the coal goes by.

The chief coal of the world is bituminous or soft coal. Our anthracite is found chiefly in Pennsylvania, although there is some in Colorado, New Mexico, and Alaska, whereas our bituminous coal is scattered throughout the United States. It exists in three fourths of them, and is mined in thirty or more. It is interesting to know that we have more coal than any other country, just as we have more and better iron. This is valuable to us as a people, because manufacturing is done chiefly by means of coal and iron, and hence we shall always have plenty to do in making things to sell.

Most of the best coal of North America is in the section east of the Mississippi River, and the greater part lies in the Appalachian Mountains. From the northern part of Pennsylvania, running down through these mountains clear into central Alabama, is a bed of bituminous coal which is from eighty to ninety miles wide. This coal bed is one of the largest and richest on earth. It is so great that it could supply the world with fuel for hundreds of years.

Another big coal field is found in Indiana and Illinois, and we have others in the central and southern parts of the basin of the Mississippi lying west of the river. There are great coal fields in Ohio, North Dakota, Wyoming, and Colorado, and in Montana and Utah. Each of these states,

it is estimated, contains billions of tons of coal. There is also coal in Washington, and enormous beds of it are to be found in the snow lands of Alaska. In 1913 the product of our coal mines sold for about seven hundred million dollars.

Near Pittsburgh the coal vein is about six feet thick; and in going along the Ohio River, and looking at the banks, one can see the black bed of coal standing out between the rocks above and below.

Vast amounts of coal are shipped from Pittsburgh to many parts of our country. One railroad company has fifty thousand cars and nine hundred locomotives which are used for coal carrying alone, while another has seventy thousand such cars. More than a million of our people are kept busy in handling coal.

We passed immense barges of coal which came from Pittsburgh as we rode up the Mississippi; we saw coal going up the Great Lakes in the boats which steamed by us as we came down to Buffalo; and we now find the Ohio River at Pittsburgh almost filled with barges ready to be floated down to Cincinnati, Louisville, Cairo, and New Orleans.

Let us take a boat from Pittsburgh, and ride up the Monongahela. That river has cut its course deep into the earth; and we can see great black blotches showing out upon the green walls of the hills on both sides. Those black spots are the openings of coal mines, and the little villages below them, with their smoke-colored houses running along narrow streets up the hills, are the homes of the miners.

Keep your eyes on the blotches. See the noisy cars drawn by mules coming out of the mines. Watch them as they rush down the inclined railroads and discharge the coal into the barges below. For half a century they have

been taking coal out of those hills, and there are vast quantities left.

Let us go into one of the mines. We crawl down through tunnel after tunnel, our way being lighted by the little lamps used by the miners. The faces of the men are as black as the coal, and they make us think of ghosts as we see them through the dim light in the distance. Notice how the tunnels are upheld by wood. We walk along a little railroad track which has been made for the coal cars, and the water drips down upon us as we go through.

"There comes a car!"

Look behind you! Stand as close to the wall as you can. There comes a car! It is hauled by a mule which goes on the trot, hurrying even faster as he moves by us. We walk for miles through one tunnel after another. They have been cut out of the coal, and there is only slate and rock above and below. Now and then we stop in rooms or chambers which were once solid coal. The mines make us think of a city, for the tunnels run in every direction and cross one another like streets.

As we go on, we perceive the many dangers of coal mining. The walls sometimes fall in and the workmen are crushed. Sometimes the mines are flooded, and the miners, shut off by the stopping up of the tunnels, are drowned.

Terrible calamities come also from what is known as fire damp. There are gases in coal mines which are sometimes set on fire by the candles or lamps of the miners. They explode, and as quick as a stroke of lightning, and

with a clap like thunder, a whirlwind of flame goes through the tunnels, pulling down the timbers and caving in the walls. The miners are blinded, scorched, and perhaps burned to cinders, hundreds being often killed at one time.

Notwithstanding all this, our miners are much better off than those of other countries. Their work is easier and their wages higher. In England the coal veins are so thin

Coal Miners at Work.

that much of the coal has to be dug out by men lying on their sides; and in Belgium the coal cars are often pulled by men and women. Children are rarely employed in the American mines; but less than a generation ago little boys and girls were used to haul coal cars in the mines of England and Scotland. They were harnessed by chains fastened to belts about their waists, and they crawled along through the low tunnels on all fours, dragging the coal cars to the surface.

Mining is now going on throughout this great Appalachian coal field. Cities have been built up by the cheap fuel, and a wonderful growth in manufacturing is being made by this means. This is especially so at the southern end of the coal beds, where valuable deposits of iron and limestone lie close to the coal. All these materials are necessary to the manufacture of iron and steel, and that region is fast growing as a manufacturing center. The city of Birmingham in Alabama promises some day to rival Pittsburgh in its product of iron and steel, and Nashville, Chattanooga, and Knoxville, in Tennessee, are thriving because of their nearness to cheap iron and coal.

30. PITTSBURGH AND ITS IRON WORKS

WE are in Pittsburgh this morning. Dense clouds hang over us and some parts of the city are black with the soot from the factories and foundries which are always pouring forth smoke and fire from their chimneys. This is one of the chief manufacturing centers of the United States. It has so much cheap fuel, and burns such quantities of it, that it has been called the hearth of the nation, and it might be named its coal bin as well. It lies where the Monongahela and Allegheny rivers flow together to form the Ohio, within easy reach of some of the chief coal, oil, and natural gas fields of our country. By the Monongahela it has access to the immense coal deposits of West Virginia, and by the Allegheny to the coal, gas, and oil regions of western Pennsylvania. It has far more fuel than it can use; and in a single year its exports of

coal are so great that they could furnish almost three tons to every family in the United States and leave some to spare.

Moreover, the transportation facilities of Pittsburgh are such that it can easily ship this coal to the markets, and also bring in at low cost the materials used in its factories, and send away the goods it makes to other parts of the United States and the world. By the Ohio and its tributaries it can reach almost any part of the Mississippi basin. You may remember that when we came up the great river, we passed coal barges floating from here down to the Gulf of Mexico; and we are now told that Pittsburgh has so many navigable waterways that they enable it to send goods by boats into twenty different states, and enough, if stretched out in one line, to reach from here across the Atlantic Ocean and over the continents of Europe and Asia to far beyond the Philippine Islands in the Pacific. The city has also many lines of railways which give it cheap transportation to the West and to the seaboard; and the traffic going in and out of it by rail is so great that it is said to surpass that of any other city of the world.

Pittsburgh is but a short distance from Lake Erie, and hence it can get iron ore cheaply from the mines about Lake Superior; and with its cheap iron and coal it has become our best center for all kinds of manufactures of iron and steel. In some years it produces one fourth of all the pig iron we make, and almost half of the steel. It makes more steel rails for our car tracks and armor for our battleships than any other place in the United States. Through its cheap fuel, and especially natural gas, it produces more glassware than any other city, making vast quantities of window panes and tableware. It manufactures tens of thousands of lamp chimneys every day, and every year enough heavy plate glass, like that used in store

windows, to roof a big farm of three hundred acres or more. It also makes air brakes, locomotives, steam engines, bridges, and electrical machinery of various kinds.

Some of the most interesting things in and about Pittsburgh are to be seen after dark. The great iron mills are kept running all night long, and out of their huge chimneys

Coke Ovens.

pour raging flames, mixed with smoke. If we take the inclined railway and go to the top of the hills about the city, we shall see such fires in every direction; and, in coming to Pittsburgh at night over some of the railroads, one rides for long distances past what seem to be mounds of blazing fire. They are the coke ovens in which the coal is roasted before it is used for smelting iron.

It seems funny to think of roasting coal, does it not?

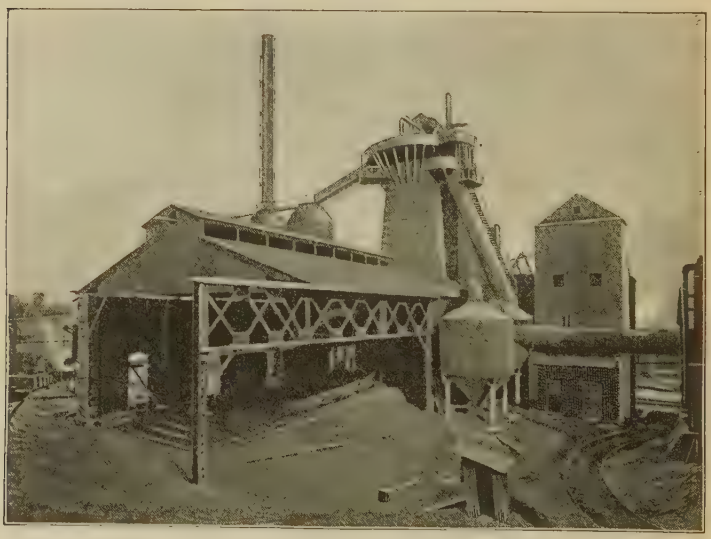
Yes; but the coal must be purified that it may be fitted for smelting, and it is this roasting that purifies it. By a short ride on the railroad we reach Connellsville, and see how the coking is done. Our train takes us by thousands of coking ovens. These are moundlike affairs of brick and stone built much after the shape of an old-fashioned beehive, save that they are connected, and that each is almost as large as a gas tank. Each oven has a little door at the side, and a hole in the top to let out the smoke.

When the ovens are filled with coal, the doors are walled up with fire brick, and by means of wood the coal of the first charge is lighted just as a coal fire is lighted. About thirty minutes later, a pale blue smoke comes out of the top; it soon grows darker; and within less than an hour there is a puff like powder, which shows that the coal has been lit. The coal is allowed to burn for about seventy-two hours, when it is taken out and a fresh charge put in. The oven is now hot and the coal lights without wood or other kindling.

There is an oven burning! Look into it! It is a mass of red-hot coals. The heat is intense, but the ovens are so made that very little air can reach the coal; and it therefore burns slowly, and many of the gases that form a part of it are driven out. One of the gases is the same as that we use for lighting our houses. The coal has now become coke.

Coke is porous, and it weighs so little that without great effort we could each lift a bushel. It burns easily and furnishes a great heat. It is cooled by letting cold water into the top of the oven. It is dragged from the oven with a great iron rake, and loaded upon the cars for the furnaces.

But there is a trainload of coke ready to start. Let us jump upon one of the cars and go with it to Pittsburgh to learn how iron is made. We shall find that a number of processes must be gone through with before the rough ore, as we saw it in the mines, can be turned into the material used for making machinery. We have already learned that there is no such thing as pure iron in nature, and that



A Blast Furnace.

the ore is always mixed with rock and other minerals. It is by smelting that these are taken out, and the iron left in the form needed for iron and steel manufacture.

One of the chief places for doing this thing is Pittsburgh. The smelting furnaces are immense round iron tanks or tubes about as tall as a six-story house. Into them is poured, first a layer of iron ore, then a layer of coke, and then one of limestone. After that, other layers of iron ore,

coke, and limestone are added until the huge vessel is filled. Limestone, as well as coke, is required to produce the change from iron ore to iron.

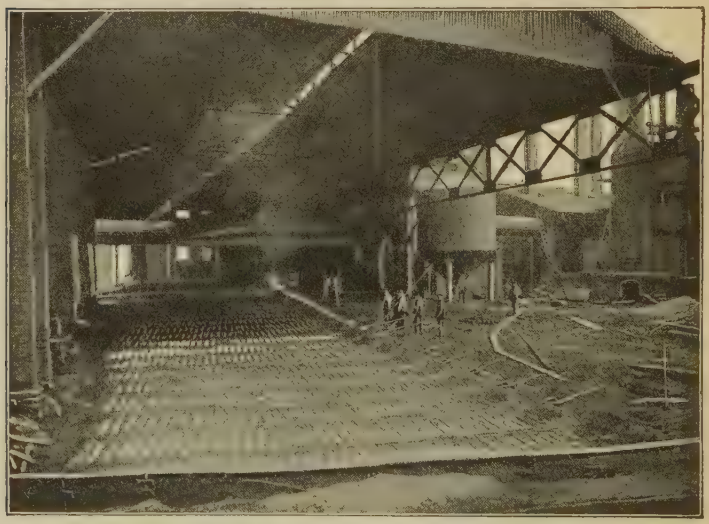
Now the furnace is ready for the fire. But an ordinary fire would not melt iron ore, so the intense heat produced by the coke is increased by means of a blast or draft made by an enormous smokestack, until it becomes so hot that the coke, limestone, and ore melt together, and form one boiling mass of liquid fire. Now the particles of iron, as they are the heaviest, sink to the bottom, and the limestone, rock, and the other lighter elements of the ore rise to the top, forming a material called slag. The iron is soon all in the lower part of the furnace, and is ready to be drawn out.

Come with me and see how this is done. At the bottom of the furnace is a little hole which has been stopped up with fire clay while the mixture was melting. It is now opened, and a red-hot stream of liquid iron flows forth. It runs out, looking like a little river of molten copper, and falls into a ditch or trough of sand. As it does so, some of the slag comes with it, but this being lighter than the iron, rises to the top, and is turned off at one side, into another little canal higher up than the first, by means of a dam with a hole under it. The stream of pure iron passes on through underneath.

The iron has now lost the copper tinge it had when it came from the furnace. It is bright yellow, and runs off in a golden stream through a bed of sand in which little holes have been so molded that it looks for all the world like a garden ready for planting. The holes are of the size and shape of what is known as an iron pig, a piece of metal about as big as a stick of stove wood. The yellow stream flows into them, and the garden is soon full of these bright

yellow pigs, which, as they cool, become darker, and finally change to the gray of cold pig iron.

Let us go a little nearer the garden. The heat waves are dancing over the iron, and it is so hot that we hold up our hats to keep our faces from scorching. Nevertheless, the furnace men are moving about without apparent dis-



Making Pig Iron.

comfort. They are turning the fiery stream this way and that, and making it reach every part of the bed. Some of them are bare to the waist, and beads of sweat stand out like pearls on their white skins. They drink great quantities of water, and perspire freely; for if they did not, they would soon be overcome by the intense heat.

As the iron grows cold, the pigs are dragged out of the sand and piled up in stacks ready to be shipped to different parts of the country, or to be used in the mills

near by for making steel, and in all kinds of iron manufacture.

The slag goes to waste. It is poured out, fiery and boiling, into a big iron pot fastened to car wheels. When the pot is filled, the men pull it over a railroad track some distance away, and empty it out upon the slag heap.

We spend some days in visiting the foundries and rolling mills about Pittsburgh, studying the wonderful processes of turning iron into steel. We see them rolling out the steel rails for our car tracks, manufacturing the steel armor plate which protects the hulls of our war vessels from the cannon of the enemy, and making the countless other things which are here produced from iron and steel.

We cross to the various parts of the city on the many bridges over the Allegheny, Monongahela, and Ohio rivers; and inspect the dams which have been so built that they deepen the waters, giving Pittsburgh a harbor twenty or thirty miles long. There are steamers at the wharves ready to start down the Ohio, and we take passage. We find the river as full of shipping as was the Mississippi. The lumber rafts are fewer, but there are scores of boats and barges and other vessels loaded with coal. The country through which we pass is much more hilly than that of the lower Mississippi. The farms along the banks are smaller. The houses are more frequent, and there are manufacturing towns at every few miles.

We sail by settlement after settlement, above which rise the smokestacks of works making iron, steel, glass, and machinery of various kinds. At Steubenville and East Liverpool we stop to watch the manufacture of china and pottery; and at Wheeling and Bellaire, farther south, visit factories where glass bottles are turned out in vast quantities. We pass many workshops on the banks of the

river as we go onward, and we learn that almost every city of this middle section of our country, not only along the rivers, but in the interior away from them, has manufacturing industries of one kind or another.

We steam on down the Ohio to Cincinnati, and there find so many factories and foundries that the place re-

Cincinnati Music Hall.

minds us of Pittsburgh. Cincinnati has about eight thousand manufacturing establishments, in which something like one hundred thousand men are employed. It has many railroads, and its location on the Ohio, at the southern end of the Miami Canal, which connects it with Lake Erie, gives the place excellent facilities for transportation by water. It is also one of our chief railway centers.

We visit the beautiful residence section on the hills,

some distance back from the river, take a walk across the great suspension bridge into Kentucky, and then, returning to our boat, sail on down to Louisville.

Here we visit the great tobacco market and tobacco factories, for which the city is noted, and then take a ride outside the town to see the grave of President Zachary Taylor, who was buried here near his old home, five miles away. We also ask some questions about Audubon, the great friend of the birds, who lived for a time in this city.

Louisville is situated at the upper end of the falls of the Ohio; but a canal has been built around the falls so that we might continue our boat ride on the river down into the Mississippi, but we decide to leave the steamer and to go northward by rail. Our train crosses the Ohio, and after a ride of three hours lands us in Indianapolis, the capital of Indiana, another important railroad center and a thriving commercial and manufacturing city. It was here that Benjamin Harrison, the twenty-third president of the United States, lived; and here James Whitcomb Riley wrote some of his most interesting poetry. We go to Monument Place, in the center of the town, to look at the statues of the great men which stand there, visit the State Capitol near by, and then drive about through the beautiful residence sections, after which we take a train for Chicago.

31. THE GREATEST LAKE PORT IN THE WORLD

CHICAGO, at the head of Lake Michigan, at the mouths of the Chicago and Calumet rivers, is the second city of the United States. It has a population of more than two millions; and its people think that it will

some day be greater than New York, and that in course of time it may rival London. Chicago grows so fast that to know exactly how many people it has one would have to take a new census every year. It is not old. It was founded about 1830, starting with a few huts in a swamp. Seven years later it had four thousand inhabitants, and

Lake Front, Chicago.

they called it a city. The idea of a city in such a place seemed ridiculous, and the other parts of the United States laughed at the conceit of little Chicago.

The Chicagoans, however, went bravely on, and in twenty years its population had risen to ninety thousand. The citizens now began to show the great enterprise and push for which they have always been noted. The ground was so swampy that no cellars could be dug on account of the water. They decided to lift the city above the swamps

and give it a solid foundation. So they propped up the houses on stilts, and brought in earth from the surrounding country, raising the streets at least ten feet, and elevating, as it were, the whole city.

Was not that a wonderful feat?

Yes; but that was only the beginning of the enterprise Chicago has shown from that day to this. The city has gone on in the way of improvements, until it is one of the best-built and most beautiful cities of our land. The Chicagoans are still noted for their energy, and are said to work faster and do more than the people of any other city of the world. Every one is in a hurry, and we find the bustle even greater than that of New York.

Have you heard of the great fire which burned Chicago to the ground in 1871? The city then contained three hundred thousand inhabitants; and like all new places, it was made up of fine buildings of stone and brick, stores and houses of wood, and rickety shanties, all mixed together. Then, one windy night, Mrs. O'Leary, an Irishwoman living in the suburbs, went to her stable to milk the cow. It was dark, and she took a lamp with her. The cow kicked over the lamp, and kindled the fire which burned the business part of the city, and destroyed two hundred million dollars' worth of property.

The kick was an expensive one, but it was a good thing for Chicago, after all. The people did not wait until the bricks of the burning city were cold before they began to rebuild, and the new houses were put up to stay. Even New York has no more substantial buildings than the best business blocks of Chicago. They are huge stone and brick structures of from ten to twenty or more stories high, and, as far as possible, fireproof. The insides of the buildings are of steel. The steel framework is entirely

independent of the walls, and the central part of Chicago has become a city of iron in walls of stone.

But how can they build such heavy structures on a swamp? The people failed many times before they succeeded in providing proper foundations. They drove great trees or piles down into the ground, and the buildings were constructed upon them, as in the cities of Holland. But the big buildings settled unevenly, and the people feared they would topple over and fall.

Then some one solved the problem by inventing a foundation of steel and concrete. The site of the structure was first covered with steel rails such as are used for car tracks. These were placed side by side, and in the spaces between a mixture of cement and sand, called concrete, was poured. The concrete soon hardened and became as firm as a rock. Then another layer of rails was placed crosswise on top of the first, and concrete spread upon that. A third layer followed, and so on until the builders thought the structure would support the enormous weight which was to rest upon it.

Chicago is the chief lake port of the world. Its growth is due to its situation at the head of Lake Michigan, at the point where goods can be most easily shipped to and from all parts of the basin of the Mississippi River, and where it can distribute the grain and other products which come from the West.

The plains about Chicago are rich. It is near the enormous cornfields and wheat lands of the United States, within easy access of the richest farming and stock-rearing parts of our country. There are also vast coal deposits just south of it, and it is within reach of the Appalachian coal mines. It has cheap iron ore from northern Michigan and about Lake Superior which can be brought to it by

(249) "Chicago has become a city of iron in walls of stone."

water; and the same is true of the lumber from the great forests not far away. As a result of all these things, it has grown to be the greatest city of the interior of our country and one of the chief commercial and manufacturing centers of the world.

As we near the city, we pass through shady suburban villages above which rise the smokestacks of factories of different kinds. The manufacturing works increase as we go on. We pass enormous steel foundries, huge iron mills, and immense shops in which all kinds of wood-working is done. Chicago is our largest lumber market, and it makes all sorts of things out of wood, such as furniture, wagons, window sashes, and doors. It has steel plants and rolling mills, and one of its great harvester companies annually produces almost three quarters of a million wagons and farming machines of one kind or another. It is also an important grain center, and its elevators and flouring mills compare with those of Minneapolis in size.

In the southern part of the city is Pullman, where hundreds of passenger cars and sleeping cars and many thousand freight cars are manufactured each year. In the stockyards, as we shall see, when we visit them later on, are annually killed vast numbers of hogs, cattle, and sheep, the meat of which is shipped from here not only all over the United States but also to other parts of the world.

We take seats upon one of the Seeing Chicago Automobiles for our trip through the city. We are high above the rest of the vehicles, moving rapidly along through street after street, turning our heads to look at the sights, as the conductor shouts out his information about them through a great horn. He takes us through the chief business sections of State, Clark, Madison, Randolph,

Dearborn, and La Salle streets and shows us the wholesale and retail establishments. He boastfully says that Chicago is the greatest of our commercial centers, and that one of its department stores is the largest on earth.

We ride through Washington, Madison, Jefferson, and Adams streets, and the guide tells us they were named after the Presidents. He adds the information that the children here are so proud of their town that one of the schoolboys, as he rode along these same streets in the Seeing Automobile not long ago, wanted to know of his father how it came that all the Presidents of the United States had been named after the streets of Chicago. We laugh, for we know the Presidents above mentioned, except Madison, were dead before Chicago was founded in 1830. Our guide tells us the city is a favorite meeting place for the delegates of the great political parties when they come together to nominate their candidates for the presidency, and that the national conventions which chose Lincoln, Grant, Garfield, Cleveland, Harrison, Roosevelt, and Taft were all held in Chicago.

Later in our ride we visit some parts of the city where the finest houses are, spinning along the boulevards, going by the magnificent mansions of Prairie and Michigan avenues and up and down the Lake Shore Drive. Here we tarry awhile and watch the many boys and girls fishing in the lake. They tell us the fish bite greedily, and that Lake Michigan is filled with the finny tribe. We enter the Field Museum, and spend some time looking at the wonders kept there, and then go on to watch a football game at the University of Chicago, one of our chief institutions of learning.

During our stay we wander about among manufacturing parts of the city, where we are surprised at the many

strange faces we see. The workshops employ thousands of foreigners who have come to the United States to better themselves; and some of them have not yet been in our country long enough to have become American citizens. Chicago has also many thousand others who were born abroad, although they are now true Americans. Indeed it is estimated that in all Chicago not more than one fourth of the people were born on American soil. The city has more than a half million Germans, a quarter of a million Irish, and about two hundred thousand Scandinavians. It has a like number of Poles and Bohemians and thousands of Italians, English, Scotch, and Canadians. It is said that there are fourteen foreign languages, each spoken by ten thousand persons or more, and that Chicago's newspapers are printed in ten different languages, while its church services are held in twenty.

Upon asking, we learn that the population of others of our great cities is largely made up of foreigners, and it seems important that they should be taught the principles of our government and be made good American citizens.

32. THE STOCKYARDS OF CHICAGO — MILWAUKEE

THE stockyards of Chicago are one of the most interesting sights of the United States. This city is the meat-packing center of the world, and its chief cattle market. It is situated in the northern part of the corn belt, where vast numbers of cattle and hogs are reared or fattened for the market, and where stock from all the great

pasture fields of our western states can be shipped over the railroads. Most of our meat business lies west of the Appalachians, and about one third of it is done in Chicago. Day and night, and every hour of the day, trains are coming in with sheep, cattle, and hogs, and at the same time other trains are starting out, carrying beef, pork, and mutton

The Stockyards.

and other meat products to all parts of the United States and to the seaboard for shipment abroad. The very animals we shall see this morning will, within a few days, be on the dining tables of New York, Pittsburgh, Boston, and other American cities and towns; and within a week or so perhaps some of them may be eaten in London, Berlin, or Paris.

But let us take a look at the stockyards. They are located almost in the center of Chicago, although quite far

off from its chief business section. We can go to them on the street cars for five cents.

As we approach the yards, we hear the lowing of cows, the grunting of hogs, and the bleating of sheep. At times there are several hundred thousand animals in the yards, and the stock is changed every day. In a single year many millions of sheep, hogs, and cattle pass through these pens.

The stockyards make us think of a city of animals within a city of men. Railroad tracks lead to it, and there are great factories about it. The houses of this animal city are merely covered and uncovered pens, arranged along streets which cross one another at right angles. There are sections and wards, and each section has its own kind of animals. Here is one devoted to cattle, the pens of which hold two or three hundred cows each. Many of the pens have no roofs, and we can see the cows through the boards. There is a ward filled with sheep. There are enough little lambs in it to supply all the Marys of our town. How the white, woolly creatures bleat and baa as we pass them. Next is the hog ward, containing tens of thousands of grunters.

Look into the pens. Each has one long trough for water, and another for food. There are twenty-five miles of these water troughs in our animal city, and the feeding boxes, if put end to end, would reach fifty miles. The water is from artesian wells which have been sunk twelve hundred feet down into the ground, so that the water supply comes from below the bed of Lake Michigan.

Through the streets of this city are railroad tracks for the cars which bring in the animals and take them off to be slaughtered. There is a canal at one side, upon which are boats for carrying animals in from and out to the lake.

Some of the Four-footed Citizens.

What is that immense building in the center of the city? That is the Exchange Hall, where its governors have their offices and where men come to buy and sell the four-footed citizens. The officials are tyrants, the most bloodthirsty any city ever knew. They fill the city with new animals day after day, only to kill them; and those great buildings which surround the yards are the slaughterhouses and meat-packing establishments, in which the beeves, hogs, and sheep are killed and turned into food and other things for the use of man.

Let us visit the packing houses. They are more like great factories than the butchering establishments of our

Interior of a Packing House.

villages. We follow the hogs. They go in alive at one end, and do not stop until they come out at the other in hams, bacon, sausage, lard, buttons, and hairbrushes. We

find that every part of the body is used, and the butchers tell us that they can sell, in some shape or other, every bit of the hog but his squeal. The same is true of cows and sheep, scarcely an atom of meat, bone, blood, or hair going to waste.

The bones of the animals are sorted, and manufactured into various articles. The skulls, the jawbones, and the teeth are used by bone burners and bone grinders. The hip bones, horns, and shoulder bones are turned into hairpins, combs, and buttons. The bones of the thigh are used to make handles for toothbrushes and other things, and the hoofs and scraps of bone and of skin are of value for glue.

The blood is sold as a fertilizer. The hides go to the tanners. The wool is pulled from the sheepskins, and the skins afterwards used for making gloves. The bristles of the hog are made into brushes, and the brains are sold for food. Some parts of the beef are turned into medicines, extracts, and tonics. Other parts are canned for soups, and out of the refuse come candles, soap, and a variety of other things.

Much of the meat is sold fresh, being shipped over the country in cold storage cars and kept in refrigerating rooms until market day. Many of our cities and towns are daily supplied with fresh meats from Chicago, and others get their meat from Omaha, Kansas City, St. Joseph, Fort Worth, and other meat-packing centers. We formerly sent a great deal of fresh meat in the cold chambers of the steamers to Europe, where it arrived in as good a condition as when it left the packing-house in Chicago. Now we have so many people that we consume almost all of our fresh meat at home, although we ship to other countries canned meats, lard, and other packing-house products worth several hundred million dollars a year.

Leaving Chicago, we take a short ride across the southern end of Lake Michigan to Milwaukee, another meat-packing center. It is the largest city of Wisconsin, and is noted for its commerce and manufactures of various kinds. The city lies on the lake at the mouth of the Milwaukee River; and its excellent harbor is so guarded by breakwaters that the largest lake vessels can enter the river and unload at the doors of the warehouses. We see ships filled with

On the Boulevard, Chicago.

grain, flour, coal, and hides at the wharves, and other vessels are taking on lumber and various things.

Milwaukee makes a great deal of iron and heavy machinery. It grinds thousands of barrels of flour a day, and it produces several million barrels of beer every year. We visit the mills, breweries, and the factories which make light yellow bricks, and then drive about through the

business and residence parts, observing that much of the town is built of cream-colored brick, from which it has been called the "cream city." Another of Milwaukee's names is the German Athens of America. This comes from its many German citizens, who are noted for their education and culture. Some of the chief newspapers are printed in German, and it has several German theaters and concert halls.

33. THE WONDERS AND TREASURES OF THE ROCKY MOUNTAIN REGION

THE Rocky Mountains form what is often called the roof of the North American continent. As we travel from Milwaukee westward, we pass through some of our richest corn and wheat regions to the Mississippi River, and then continue our journey over other rich plains for one thousand miles. We rise steadily until we come to the Rocky Mountains at Denver.

Although it is at the foot of the mountains, Denver is only about one thousand feet lower than the top of Mount Washington. Pikes Peak, which we see as we near the end of our railroad ride, is almost two miles higher than Denver, and nearly three miles above the level of Washington, New York, or New Orleans.

Pikes Peak is one of the highest of the Rocky Mountains. It was named after Major Zebulon Pike, who tried to climb it more than ninety years ago, but was obliged to turn back, sadly remarking that nothing but a bird could reach that snowy summit.

But we shall reach the top of Pikes Peak, riding there

at our ease in the cars. A railroad has been built up that mighty mountain. The road is much like the one over which we traveled in ascending Mount Washington. The little steam engine pushes us up, up, up, until we at last step out of the car at a height of almost three miles above the sea. Near the top are patches of snow such as often

The Garden of the Gods.

exist here even in summer. We make snowballs and have a snow fight while we stay.

As we stand upon Pikes Peak, we see a wonderful panorama of mountains and valleys. Stretching to the eastward are the great plains, dotted with villages and cities, through which we have just passed. They are mere specks on the landscape. At our feet is the Garden of the Gods, a valley filled with huge rock formations, but so far down that it looks like a flower bed. To the west rise hill upon hill and mountain on mountain, looking like piles of rocks of gigantic size, thrown together in all sorts of shapes.

As we stand here, the clouds are floating about and below us. Now they sweep upward, and for a time we are enveloped in mist. Now there is a thunderstorm far down the mountain side. The lightning flashes against the rocks, and we hear the deep roll of the thunder as the clouds burst on the mountains.

This Rocky Mountain region is the wonderland of America. There is no other place in the world where we

Scene in Yellowstone Park.

can see so many marvelous things. It has waterfalls higher than Niagara, deserts almost as dry and dreary as the Sahara, great forests which have been turned into stone, and other forests whose trees are so big that a very large schoolroom could be cut out inside the trunk of one of them and leave room to spare.

In Alaska, at the northern end of this great mountain region, are glaciers more wonderful than those of the Alps; and in its southern part are the mighty volcanoes of Mexico, which vomit forth lava, sulphur, and red-hot stones.

Within a radius of five hundred miles of Pikes Peak lie three of our great natural wonders. At the northwest are the hot springs and geysers of the Yellowstone Park; almost directly west, and at about the same distance, is the Dead Sea of America, the Great Salt Lake of Utah; and farther south lies the Grand Canyon of the Colorado, the most wonderful river valley known to man.

The Grand Canyon.

The Colorado River rises among the clouds near the snowy peaks of the mountains. It burrows its way down through the high plains, cutting out a trough or gorge which in one place is more than a mile deep, and finally flows out into the ocean through the Gulf of California. It has numerous falls, many rapids, and in places is a raging torrent. The scenery about it beggars description. The high walls of rock which form its banks are colored in the brightest tints of red, chocolate, yellow, and gray; and they rise in such shapes that, as one floats down its boiling current, he seems to be flying by mighty cities, dashing under huge forts, and past enormous cathedrals. At times the clouds gather over the top of the gorge, and he floats on in the

darkness. Then the clouds break and the clear blue sky shows through.

The region along the Colorado River is for the most part rock and desert, with but little vegetation except sagebrush and cactus. This is the character of much of our great western plateau. We find rocks of all kinds piled together in cliffs several thousand feet high, or cut down into canyons thousands of feet deep. There are hills of rock, mountains of rock, valleys which are rocky deserts, and rocky plateaus upon which we might travel for days without finding water.

This is all very wonderful, is it not?

Yes; but after a while, when we visit the Yellowstone Park, we shall find something more wonderful still.

We shall see many strange things above ground, and by going down into the earth may visit gold and silver mines such as can be found nowhere else in the world. You may have read in the "Arabian Nights" about the cave of Aladdin, which was filled with gold, silver, and precious stones. That cave existed only in the mind of the man who wrote the story. The treasure vaults we are to visit are real treasure vaults, from which gold and silver worth millions of dollars have been taken and which are now yielding millions more.

From their beginning in Alaska, southward through the western part of the North American continent to the Isthmus of Panama, the mountains have many veins and beds of gold and silver. Not far from Pikes Peak, rocks are sometimes dug up which are so full of gold that if you roast them the precious metal will bubble out and stand up like golden pinheads upon the dark stone. In one mine near Leadville, Colorado, gold is found in the form of thin sheets and plates, squeezed in between the rocks; and in

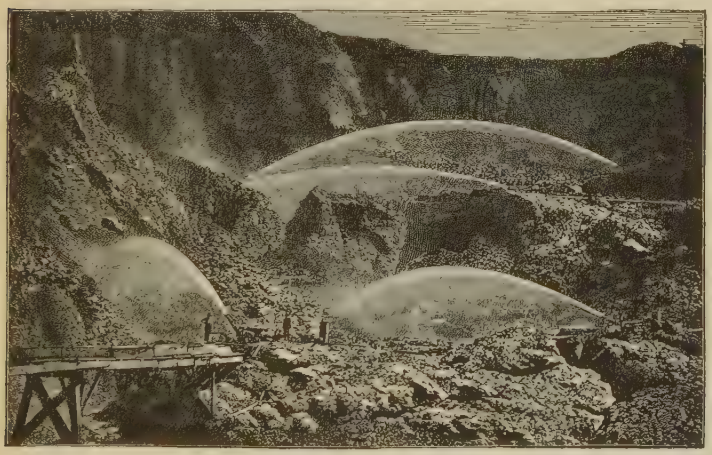
the Sierra Nevada Range are vast bodies of white quartz with little veins of gold running through them. The gold is sometimes so mixed with the rock that it has to be ground to powder and chemically treated before it can be gotten out, and the rock itself is often melted to extract the gold.

The first gold found in the West was taken from the rivers. The sand of many mountain streams is mixed with gold dust, or grains and lumps of gold. In 1848 James Marshall, while digging a race for a sawmill on the banks of the American River in California, found some bits of yellow metal which turned out to be gold. The news spread, and within nine months thousands of miners were washing the dirt along the banks of the California rivers. In less than a year more than five million dollars' worth of gold had been dug up; and within four years more than two hundred million dollars' worth had been washed out of the streams of the Sierra Nevada. Upon hearing the news of this, men from all parts of the world rushed to California.

Then gold was found in the mountains farther to the eastward; and it is now known that there are gold and silver in every one of the states and territories of this region. Since Marshall made his discovery, more than two billion dollars' worth of gold, and over one billion dollars' worth of silver, have been dug out of the Rockies. Hundreds of towns have sprung up in the mountains to accommodate the miners, and Denver, San Francisco, and other cities have come into being.

At first the miners washed out the gold-bearing earth in pans, then they used cradles or troughs which could be rocked back and forth, and later they conducted the streams down the mountains to the mines, and by hose

threw the water against the sides of the hills to wash down the gold-bearing gravels. This last method is called hydraulic mining. They also built flumes, or troughs, into which they turned the streams. On the bottoms of the troughs sticks were nailed, and quicksilver placed there. Then the precious earth was thrown in. The water washed away the mud; but as it went, the grains and dust of gold



Hydraulic Mining.

fell to the bottom, to be swallowed up by the quicksilver, which dissolves pure gold and gathers it into itself as water does sugar.

But all this mining which we have so far described relates only to the loose gold made by the wearing away of the rocks in which the metal is. The miners soon began to hunt for the rocks themselves and to crush them to get the gold out. It is from such mining that the most of our gold now comes.

34. A VISIT TO A GOLD MINE

TO-DAY we shall first go down into one of the great gold mines of Colorado, and see something of the enormous work it takes to get this precious ore out of the earth. We shall then follow it to the mill, and learn how the gold is taken out of the rock with which it is mixed.

Our mine is situated high up in the mountains, more than two miles above the sea, and not far from Pikes Peak. As we ride to it on our donkeys, we wonder how the miners could tell there was any gold there. On our way, however, we see hundreds of holes which have been dug by the men who failed to find gold, and we are told that many men search in vain for days, weeks, and years to discover new mines. Gold, as you know, does not exist everywhere, and it is only when veins of rich gold-bearing rock are discovered that it pays to sink the shafts and make the tunnels which are usually needed to get the ore out.

At last we come to the mine. The building above it looks more like a big factory than anything else. It contains an immense steam engine, and hoisting machinery to lift the cars of ore up out of the ground. The building is known as the shaft house, and the hole which goes down into the mine is called the shaft. The shaft of this mine is about eight feet square, and almost as deep as the Washington Monument is high. Elevators are always moving up it, bringing out the rock which contains the gold. We can jump on the elevator and go down into the mine. The shaft is sunk just at the side of the vein of gold-bearing rock, and from it tunnels are dug off here and there into the vein to extract the ore.

Each tunnel has a little railroad, and the golden rock is loaded into iron cars of about the size of a dry goods box. Each car holds a ton of ore, and when it is filled it is pushed upon the elevator, and a signal to the engineer brings it to the top.

A car is being taken off as we reach the shaft house, and the manager of the mine directs us to step on the elevator. He signals the engineer, and we start down into the mine. Within a few seconds we are far below the surface. The darkness of the shaft is so dense we can almost feel it, and we huddle together in fear.

"Far below the surface."

We drop sixty-five feet before we come to the first level. Here we see a score of dirty miners, each holding a candle, whose light makes him look almost ghostlike against the darkness of the tunnel at the back. They have a carload of ore which they want to send to the top. We now drop to a second level, sixty-five feet below this, where another huge tunnel has been cut out of the mountain; and at last, at the fifth tunnel, three hundred feet below the surface of the earth, we leave the elevator.

The miners lend us their candles, and as we walk along, the manager points out the vein of rock which contains the gold. It looks just like slate, and seems to be a sandwich of slate between walls of other rock running slantwise down into the earth. How deep it goes no one can

tell. The tunnels are pipes of rock cut, as it were, out of the golden meat of the sandwich.

As we go on through the tunnel, we see how difficult it is to get out the ore. Here a miner works by the light of a tallow candle. He has a piece of steel as big around as a broomstick in his hand, and about as long. He is pounding it with a hammer, moving it around and around, making a hole in the rock. Now he lays down his tools, and takes up what looks like a big candle, and sticks it into the hole. Notice how carefully he handles the candle. It is well he does so, for it is dynamite, and should it go off it would blow us to pieces. He is using it to blast down the rock. Now he connects a fuse with it, and packs the earth tightly about it. He lights the fuse, and the manager tells us to run. We do so, and are in a side tunnel when a terrible explosion occurs. The very earth seems to shake, and the air is blown so that our candles go out, although we are now a quarter of a mile away. We hear the rock fall, and returning find the miners digging it out with picks, and throwing it into holes in the bottom of the tunnel which extend down to the cars in the tunnel below.

The ore, as it is loaded upon the car, looks for all the world like ordinary rock. We can see no signs of gold about it, and still each ton of that rock contains from ten dollars to several hundred dollars' worth of gold. Some parts of the vein are richer than others, and some of the ore is so valuable that it is put in sacks by itself, a little half-bushel sack of the rock being worth as much as ten thousand dollars.

Different kinds of ore need different treatments to extract the gold. The rich ore goes to the smelters, where it is put, with certain other materials, into furnaces, and so

melted that the gold is extracted. Other ores are treated by chemicals in various ways; and much of the low-grade ore, or that which contains only small quantities of gold, is sent to the cyanide mills. This process is an important one, for it enables us to save much gold which was formerly lost.

Let us go to the top of the shaft, and ride on an ore car to the cyanide mill. The car is filled with granite and broken stones of different colors. Pick up a piece of rock from any part of the load on which we are sitting. You might put it under a microscope, and not see a glint of yellow, or anything which to your eyes would indicate gold. Still, that rock will average half an ounce, or about ten dollars' worth of gold to the ton. In it only one atom in many, many thousands is gold. The question is how to get the gold out.

The superintendent of the works explains this as we ride on the car up to the mill. The engine drags us over a trestlework track to the top of the building. The rock is thus taken to the top in order that it may be carried from one level to another by means of gravity.

We look down upon the load as we go on. There are specks of stone as small as the head of a pin, and immense bowlders weighing hundreds of pounds. All must be crushed to powder before the ore can be worked in the cyanide process.

The cars stop at the top, where the ore is thrown into what looks like a gigantic coffee mill; it is as big around as a hogshead, but not at all deep. As the rock falls into it, the great steel teeth of the mill seize the stones and grind them to pieces. We imagine we hear them groan as they are crushed, and shudder at the thought of getting into the jaws of the machinery. This mill grinds the ore

to the size of a walnut. It then passes into another, which cuts it into pieces no bigger than a pea, and it is then ready for the drier.

Every molecule of moisture must be taken out of the ore before it can be ground to powder. This is done by passing it through huge steel tubes fifty feet long and as big around as a flour barrel. Through these tubes flames of gas continually blow, and the heat takes all the moisture out of the rock.

Rock Crusher.

Now an elevator of iron buckets, much like that we saw in the flour mills during our travels in the bread lands, carries the ore again to the top of the works, where it is emptied into steel crushers, which grind it to powder. The ore which we first examined as broken rock has now become a flour. It seems like dust, but each grain of it contains a bit of gold, and so the dust is of value. The rock was hard and rough. The dust is so soft and fine we can rub it to and fro in our hands without scratching the skin, and it looks much like pumice stone powdered. It has, however, no gleam of gold, and were it on the road we should walk over it without thinking.

Now out of each of the grains of dust the gold is to be taken. This will be done by giving it a bath in a solution

of cyanide of potassium and water. Cyanide of potassium is a chemical which looks like alum. When dissolved in water, it has such an attraction for gold that if there is any gold in anything which it touches, the gold will melt into the fluid and become a part of it, just as sugar or salt goes into water. The dust with the gold in it is put into circular tanks of steel, about as high as your waist, and so large around that you could not get one of them into an ordinary schoolroom. Then the cyanide water is let in. We can see it flowing out of the pipes into the golden flour. It looks just like water; but if we should taste it, it would surely kill us, for the cyanide is poisonous. As it runs through the flour, it turns the latter into a great pot of brown mush or mud. It would make good mud pies; but they would be pies seasoned with gold. As the cyanide water goes through it, the gold leaves the mud and passes into the water, which is then drawn off through the bottom of the tank.

Come down below and watch it as it flows out. There is still no sign of gold. But we shall follow the cyanide stream and learn that it is really there, for we shall see the gold gotten out. We have seen how fond cyanide is of gold. We now find that it likes zinc even better. The golden water is run into boxes filled with zinc shavings, which look for all the world like the excelsior we use for packing. As the water touches these shavings, the cyanide attacks the zinc and drops the gold so that when the water is drawn off the gold is left on the corroded zinc. The shavings are now washed to get off the gold; and the dirty zinc and gold are so smelted in a furnace that when the mouth of the furnace containing them is opened, a fiery stream pours forth, which, being run into a mold, soon hardens into a brick of gold as pure as the finest wedding ring.

As we travel on through the Rockies, we find gold-mining camps almost everywhere; and away off in the mountains, hundreds of miles from any city, we see men going from place to place, digging, or prospecting, for gold.

We discover that the United States is still one of the chief gold-producing countries of the world, and that in some years it yields so much that if it were all equally divided, it could supply a five-dollar gold piece to every family in our country, and there would yet be some left. There is some gold found in our eastern states, and much is mined in the Black Hills region of South Dakota; but by far the greater part of the product comes

Prospecting for Gold.

from this high plateau where we are now. Gold veins are to be found not only in the main body of the United States, but also on that part of these highlands running north through Canada and in our territory of Alaska, which is

now producing vast quantities of this precious metal every year.

Now and then we meet a prospector or gold hunter, a miner who goes over the country searching for new gold discoveries. He often travels on foot with his shovel and pick, his gun, his cooking utensils, provisions, and blankets loaded upon a little donkey, or burro, not larger than a Shetland pony.

He sleeps in the open air, and shoots such game as he can to help out his food. He looks carefully at the rocks as he travels, and now and then digs near the streams and washes the earth to see if it has gold in it. If he finds any, he tries to learn where it came from, following the signs until he reaches the quartz or mother lode from where it was washed away.

35. A DAY IN A SILVER MINE

YESTERDAY we spent in the depths of the earth, surrounded by gold. To-day we are to visit one of the richest of our silver mines. The United States and Mexico produce more silver than any other countries. There are mining towns which are built over beds of silver-bearing rock, in which paying mines might be sunk by digging under the principal streets. That is the case with Leadville, which is in one of the chief silver regions of Colorado.

The mine we shall enter to-day is still farther west. It is located in the Wasatch Mountains, near Park City, Utah, and it has already produced more than thirty million dollars' worth of silver.

We ride through the muddy streets of Park City and up

the narrow gulch behind it, past great works which are crushing the ore to extract the silver, and on up to the big barnlike buildings which contain the machinery for getting the ore out of the mine.

Here there is a shaft like that by which we descended into the gold mine. The ore forms a great vein of silver-

Mining District — Leadville.

bearing rock between walls of other rock. No one knows how far down into the earth this silver vein goes. The shaft which has been sunk beside it extends about one third of a mile, and at levels one hundred feet apart tunnels have been dug into the vein to extract the ore. These tunnels are from four to six feet in width, and so high that we can walk through them without stooping. From the tunnels the miners have worked upward along the vein, blasting out great caves and rooms in the mountain, all of which have been walled and roofed with timbers to keep the earth from falling in.

A good idea of a silver mine might be had from a big apartment house or office building. Take this mine, for instance. It has fifteen stories, each one hundred feet high. In the shaft is an elevator which a steam engine raises and lowers, carrying the ore and miners from story to story. At each level a tunnel runs off through the vein and connects with the rooms, or stopes, as they are called by the miners. The tunnels are the halls of this mining flat, and the stopes are its rooms, dug upward and outward in removing the ore. Each tunnel has a little railroad running through it, and there are about fifty miles of such tunnels in the mine.

The ore cars are of iron. They are always loaded by gravity. The tunnel of each story is connected with that of the story below by a long chute or pipe cut out at such an angle that the ore dumped in above will fall down into the car placed at the lower end of the chute in the tunnel below. This saves the labor of lifting the ore.

But the manager is ready to take us into the mine. Two cars, each containing fifteen hundred pounds of silver ore, have just been wheeled off the elevator, and we are told to step on.

As we do so, the manager signals the engineer, and we start down into the earth. We drop at once into the darkness, descending as fast as though in the elevator of a Chicago hotel. We are warned to keep close within the cage, as a hand or a head might be taken off by a projecting timber. We grasp the iron rail above us, and hold on for dear life, trying to shrink ourselves inward as we go down, down, down. Now we catch a glimpse of a candle in an opening as we pass one of the levels. Now our ears are dinned by the blasting, and the sound so shakes the air that our candles go out. We light them again when

we fall to the next level, and the faces of the miners about us look weird in their flickering glare.

The danger makes us shudder, and we feel at times as though we were on the very edge of the grave. We tremble still more at the sixth level, when a miner steps on with a box of dynamite candles. The box is not more than two feet square, but it has enough dynamite in it to blow up the Capitol at Washington. There is no cover on it, and as the man places it close to our feet, we think of the terrible possibilities. We are five hundred feet under the ground. Suppose a rock should drop from the top into that dynamite! We can feel our hair rising and our faces turn white. We ask as to the danger, and are told that it is comparatively small. We know it is dynamite, however, and feel much relieved when it is taken away.

And so we go on to the bottom. As we descend, we hear the rushing of water. Many of our silver mines are wet mines. The water has to be kept out of them, and this necessitates vast pumping arrangements. This is a wet mine, and among its works is a famous tunnel built at a cost of five hundred thousand dollars to carry the water out of the mine. This tunnel is a subterranean passageway three miles in length, so high that we walk through without stooping. It has a wood floor upon which is a railroad carrying ore cars, drawn by mules, to the various parts of the mine.

As we walk over the road, we hear the rushing of water, and look through the cracks in the flooring. There is a torrent flowing beneath us. It comes from the mine at the rate of ten thousand gallons a minute, and as we listen, we hear it falling, falling, as it drops from the levels above.

Not one ounce of silver was found in all the rock which was dug out to make this tunnel, and the half-million dollars

it cost was spent solely to get the water away from the other parts of the mine.

It is the water that necessitates the walling of the tunnels and the stopes with logs. The wet earth is always pressing in, and were the timbers removed, the mine would not last an hour. It is necessary to know how to put in the woodwork, and among the highest-priced men employed in the mines are those who take care of the timbers and go through the underground workings daily, looking for weak spots. The best of wood is required, and that used here comes from hundreds of miles away in the forests of Oregon.

Timbers in a Mine.

And so we move along from tunnel to tunnel. Now we climb into one of the stopes, and watch the miners. We have candles in our hands, and crawl along, bending almost double, the water dripping down upon us. At last we enter a stope where a half-dozen miners are working. Some are taking the ore out with picks, digging away at a pile of rock which has been blasted out by dynamite. Their wire candlesticks are stuck into the rocks beside them. Others are loading ore. They are pushing it into the chutes with long-handled shovels, and we can hear it roll down and strike the iron bottom of the car underneath.

In other places men are drilling in order to blast. They blow down the rock with dynamite just as the men did in

the gold mine we visited. There goes a blast now. The dynamite has torn the rock out of the earth, and a great mass of silver-bearing ore has been loosened from the sides of the mountain. As we stop, the miners show us the vein. It is from six inches to forty feet in width, the average being fifteen feet, and in it we can see streaks of silver ore, some of which are three feet wide.

But let us follow the ore to the mill. It is put into the steel cars, raised to the surface, and carried in wagons to some immense frame buildings farther down the mountain. First it is run through a crusher, which chews the rocks between its teeth until they are ground into pebbles and fitted for the drier. The wet ore is dried much as we saw the gold rock roasted in the cyanide mill. It is next pounded to flour with heavy steel stamps, and then mixed with salt, and roasted again in such a way as to prepare it for the quicksilver, which, as we shall see later on, dissolves the silver out of the ore flour.

After being roasted the hot ore is left for a time piled up on the floor of the furnace room. We see several such piles as we go in. They look like sand, and we feel tempted to jump into them, when the manager pulls us back, and tells one of the men to stir up a pile with a shovel. He does so, and we see that only the outside is yellow. Under that thin coating the ore is red-hot. Had we jumped into it, our legs would have been burned to a crisp.

The process by which the quicksilver takes the silver out of the ore makes one think of the prince in the fairy tale, who broke through the hedge and kissed into life the princess who had been sleeping for a hundred years. It is the quicksilver prince, in fact, who kisses the sleeping silver-ore maiden into life, and carries her away from the palace of rock in which she has been locked for ages.

After the sand has cooled, it is taken into the pan room, and is thrown into great pans of iron, each of which holds about three thousand pounds. Water is introduced, and this turns the ore sand to a thick brown mush.

Now into each of the pans, through a little pipe, are poured three pounds of quicksilver, and stirring machinery is set to work, which moves about through the ore, mixing the quicksilver with it. The sand was warm, and the quicksilver by the warmth becomes active, and by the mixing

Interior of a Silver Mill.

divides into drops as big as the point of a pin. The mixers move about at the rate of sixty revolutions a minute, sending these little quicksilver drops through the sand. As they go, they seek out the particles of silver, and as each drop of quicksilver touches an atom of silver it sucks it into itself. This traveling of the quicksilver is kept up for eight hours, at the end of which time all of the silver in

the sand has been absorbed by the quicksilver. The two metals have united, and the marriage is complete.

The quicksilver is now drawn off, and we have a bucketful or so of quicksilver containing the silver. The mixture is separated by putting it into a furnace, which is so tightly sealed that not even vapor can get out of it, except through a pipe at one end. Then the fire below is made hotter and hotter, until at last the quicksilver, which vaporizes at two hundred and sixty degrees of heat, rises up in the form of vapor. It flows off into the pipe, and is condensed farther on by cool water passing over the pipe, and thus saved.

Silver does not vaporize at this temperature. After the quicksilver has left it, it is allowed to cool; and when the furnace is opened, it is found upon the bottom, looking for all the world like a piece of old plank covered with ashes. It is now impure silver bullion, and is ready to be shipped to the refining furnaces in other parts of the country, where, by means of chemicals, it is further purified and fitted for the mint, where it may become silver dollars.

36. ACROSS THE ROCKIES TO SALT LAKE

THE trip from Denver to San Francisco requires about thirty-six hours of fast railroad travel. We find the journey far different from those we took in the eastern part of our country. The railroads climb right over the Rocky Mountains. They wind about one curve after another, through great gorges where the cliffs seem about to fall down upon us, climbing always upward, until at one place they reach a pass where we are two miles above the sea.

Snow lies on the Mountains all the Year Round.

Here everything is dry, rocky, and thirsty-looking. The air is so clear we can see for miles. In climbing the mountains, we find that we have to stop every few moments

to breathe. Some of us feel faint and sick from the rarity of the air, and we are told that many people are always attacked by mountain sickness at this altitude. I have seen women grow faint in going over Marshall Pass, on the Denver and Rio Grande Railroad.

We ride for miles without being out of sight of the snow which lies on some of the mountain peaks all the year

Railroad over the Mountains.

round. In the winter it falls in such quantities that the drifts cover the railroad tracks; hence miles of snowsheds have been built around the sides of the mountains over the road, in order to keep the snow from stopping the cars. Going through these sheds is much like passing through a long tunnel, except that, here and there, is a crack through which we can peep out and see down, perhaps thousands of feet, into the valleys below.

The scenery is magnificent, and as we look at the snow-clad peaks we remember the vast deposits of gold, silver, copper, and lead which they contain, and wish we could go

off into the mountains and live for a time with the miners, watching them get out the ore. We should like to fish in the streams that come tumbling down the hills at the sides of the tracks; and we do not get tired of watching

Mountains in Utah.

the herds of cattle which we see now and then under the charge of cowboys.

We pass great flocks of sheep watched by shepherds on foot or on horseback. Many of them have covered wagons in which they live from one year's end to the other, as, aided by their dogs, they drive the sheep from place to place searching out the best feeding grounds.

As we see the wagons standing out on the plains with nothing but the bare rocks, dusty grass, and blue sky about them, it seems to us that the shepherd's life must be lonesome; and we are told that they sometimes go crazy from thus living all alone in these dreary surroundings.

At times we go by prairie-dog villages — little hillocks,

each of which has a hole leading down into the nest where these little animals live with their young. Prairie dogs are of about the size of small rabbits. Some of them sit on their hind legs, on the tops of their little houses, and watch the cars as they go by. Others are frightened, and scamper into their holes.

Prairie Dogs.

We look in vain for the grizzly bear, deer, and mountain sheep. Such animals are seldom seen near the railroads, although a few hours' walk from almost any of the stations would bring us to places where they could be found.

The country grows more dusty and dreary as we travel on westward, when all at once we come out into the green valley of the Great Salt Lake, and find ourselves in Salt Lake City, the capital of Utah.

There are few more beautiful towns than Salt Lake City. It lies in a valley, surrounded by mountains which, at the back of the town, rise more than a mile upward, their heads crowned with everlasting snow. A short distance away to the northwest is the Great Salt Lake; and northward and southward, as far as we can see, is a valley covered with meadows, orchards, vineyards, and gardens.

Salt Lake City has wide streets, shaded by great forest trees. Its houses have broad lawns about them; and along the sides of each street a tiny stream of mountain water flows. There are but few poor buildings, and it is a prosperous place.

Salt Lake City was built by the Mormons, who, with Brigham Young as leader, long before the days of railroads, traveled over the plains and mountains, and picked out this spot for their city.

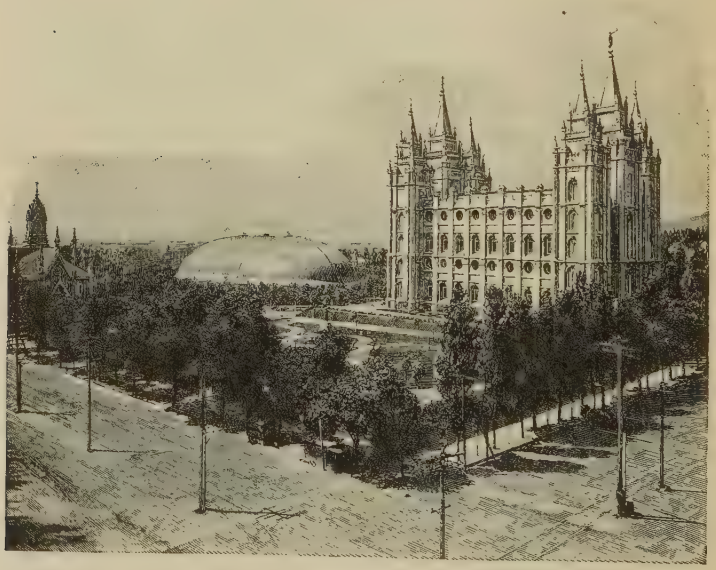
The Mormons were a body of men who thought they had received a new revelation from God which they were

Salt Lake City.

to obey. Among other things, they believed that it was right for a man to have more than one wife; but as that is against the laws of the United States, they do not now practice this belief.

The Mormons laid out their city in squares of ten acres each, and began to erect the great structures of the Mormon Church, which are now among the remarkable buildings

of the world. The Mormon Temple is one of the grandest churches in this country. It is built of granite from quarries in the mountains near by. It covers more than an acre, and is one hundred feet high, with great towers, which rise up more than one hundred and twenty feet higher than the main structure. The temple was almost forty years in



Mormon Temple and Tabernacle.

building, and it has cost half as much as the Capitol at Washington. In it the Mormons meet occasionally for certain special observances of their religion, and outsiders cannot enter.

Not far from the temple is the huge tabernacle in which the Mormons worship on Sunday. It looks like an enormous bath tub, or the half of an eggshell set upon pillars.

It is made entirely of iron, glass, and stone, with a roof of stamped copper. The tabernacle has seats for nine thousand people. Upon ordinary Sundays more than six thousand men, women, and children go to church there, and often the seats are all filled. These people, who were very few at first, grew in numbers from year to year, and it is now estimated that there are several hundred thousand of them in Utah.

At the time the Mormons came to the Salt Lake Valley it was almost all desert. They turned the streams of water out over the land, irrigating it, and thus transformed it into prosperous farms. As we travel onward, we shall learn that much of the desert will make the best farming land if it can only have water.

Our next trip is to the Great Salt Lake. We can reach it in less than an hour by the cars. It lies in a vast basin between the Wasatch and Sierra Nevada ranges. This basin has no outlet to either ocean, and most of its drainage flows into this wonderful body of water.

The Great Salt Lake is one hundred miles long, and its average width is twenty-five or thirty miles. It is so bounded by mountains that streams of fresh water are always flowing into it. Evaporation is so rapid, however, that these streams do not raise the level of the lake, and its waters are so salt that thousands of tons of salt are made by evaporation along the shores of the lake; and there is so much soda in it that at one place on the beach a windy night never fails to pile up many tons of soda washed there by the waves.

The lake is six times as salt as the waters of the ocean; and although it is more than a thousand miles away from either the Atlantic or the Pacific, it gives the most delightful salt water bathing.

We all take a swim, and find that we cannot possibly sink. Our bodies from the shoulders upward stick out above the surface of the lake, and we bob up and down

Bathing in Great Salt Lake.

upon it like the cork on a fishing line. The salt makes the water so heavy that, try as we may, we cannot force ourselves to the bottom. As we lie thus, floating with our arms folded, we need not be afraid of a shark nipping our legs; and, as we tread about, there is no danger of fishes or crabs biting our toes. We might fish here for years and not get a bite, for the Great Salt Lake is so salt that no fish can live in it.

Nevertheless, some of the streams that flow into the lake are full of delicious brook trout, and were we to follow the Jordan from its mouth in the lake up to its source at Utah Lake, we should find there one of the prettiest and sweetest little bodies of fresh water of all North America.

37. RECLAIMING OUR WASTE LANDS

THE vast plateau upon which we are now traveling, and much of the land to the east and west of it, were long known as the Great American Desert. This was supposed to begin in Mexico and run northward across the United States, spreading out like a fan and ending in Canada. Until railroads were built across our continent, this dry region had fewer people than the Sahara in Africa; and for a long time no one supposed it would be of any value to us. Then mines were discovered, and now it yields every year about one hundred million dollars' worth of metals, chiefly copper, silver, and gold. As the prospectors went over the country, they found vast tracts fitted for grazing cattle and sheep, and now some of our largest herds and flocks are reared there. They discovered also little well-watered valleys and basins in the mountains where the soil was moist enough to grow crops, and many small farming settlements sprang up to supply the miners with food.

After the Mormons had used the streams near the Great Salt Lake to irrigate their farms, it was discovered that the most bountiful and surest crops could be grown in that way. The people then began to seek out tracts of land along the rivers and streams where they could construct dams and canals so as to carry the water over them. Such irrigation was largely done along the eastern foothills of the Rockies, and especially in California, where the irrigated lands were found to produce the most delicious oranges, lemons, grapes, and other tropical fruits.

As time went on, and the well-watered lands of the country grew more and more scarce, the scientists of our

government at Washington made plans to reclaim such of our dry public lands as could be irrigated. They saw that if dams could be built at certain places in the mountains, the heavy rains and snows of the winter might be stored up in lakes and reservoirs there and let out as needed. They also planned how, by means of costly dams and canals, the waters of the rivers might be carried over more and more land.

But to do this would require a vast deal of money, and the question was where to get it. The people of the United States were already heavily taxed, and our Congress knew they would not like to take on this additional burden. Then the idea was brought forth that these desert places might be made to pay for their own irrigation and for the irrigation of other lands. It was found that the arid regions belonging to the government lay in sixteen or more different states or territories. All of these had some good public lands left in addition to their desert or dry lands, which without water no one could use. So in 1902, Congress passed a law that the money which those states received from the sale of the government lands should be saved and set aside as a fund to put water upon the dry lands. Within a short time the money so collected amounted to thirty or forty million dollars, and this vast sum is being employed in that way.

Moreover, the law provides that when a tract of desert has been so watered, it shall be sold out in small plots to settlers on long time, for just about what it has cost to make the improvements. In this way the sales of the desert land thus irrigated bring the money all back to the irrigation fund; so that the desert really pays for itself, and the fund can be used over and over again to reclaim more and more land.

By this means immense dams and reservoirs have been constructed throughout these semi-arid regions, the waters from the great rivers have been turned out through the desert, and so many canals have been dug that if they were placed end to end, they would make a stream long enough to reach about one third of the distance around the world. Thousands upon thousands of new farms

An Irrigation Canal.

have been made, and an enormous value has been added to the wealth of our country.

Not far from Phœnix, Arizona, a dam has been built across a mighty gorge through which the Salt River runs, so that its waters are held back, creating a lake holding enough to cover a million acres with water to the depth of one foot. A few years ago all the country below that lake

was dry sand. Now it is covered with irrigated farms yielding the finest of raisins, melons, apricots, and peaches, and oranges which are so large and sweet that they have been called globes of bottled sunshine. In the same region are farms upon which hundreds of baby ostriches are hatched every year. The ostriches delight in the hot sun; and they grow fat upon the grass, alfalfa, and other vegetation of the irrigated lands.

Some great irrigation works have been established along the Colorado River. Others are so holding back the waters of the Carson and Truckee rivers in Nevada, that they have reclaimed several hundred thousand acres; and there are also dams and canals made for the same purpose in South Dakota, Montana, Idaho, Wyoming, Colorado, California, Washington, and other western states.

The people of the irrigated regions tell us they would much rather depend upon the streams than upon rain. They know they will always have enough water for their crops, and that they can feed them with just the right amount at just the right time. Moreover, they say that the soil, so watered, produces far more. In many parts of the West an irrigated farm of ten acres yields more money than a corn patch of one hundred acres in the rich Mississippi Valley; and in the orange and grape lands of southern California, or the irrigated apple valleys of Oregon and Washington, a tract of six acres often supports a whole family.

These irrigated farms are sometimes so small that the whole country is more like a village than like the widely separated farmers' homes of the cultivated parts of Kansas, Nebraska, or Texas, or even of our middle and eastern states. The farmhouses are near together, each having ten, five, or even less acres about it; so that the people have to walk

but a few steps to talk to their neighbors. In some such settlements the water is so carried in pipes along the roads that every house and barn has running water in it. In many of them the water, falling from the dams, operates electric plants which light the homes of the farmers; and they have also telephones, so that one can have the ears of his neighbors close to his mouth. Moreover, the farms are so near one another that the schoolhouses are not far away from any of them, and the children can come together for games much more easily than in the regions of large farms where rain alone furnishes the water. We shall see many such settlements in the western parts of our country.

Is not water a wonderful thing as regards the comfort and support of man? Upon it, quite as much as upon the character of the soil, depends the prosperity of a country or people. It is not only necessary that the earth should have water, but that it should have just enough and at just the right times in order that it may yield the food and other things needed by man. In the eastern parts of the United States enough is provided by the rains which fall at regular times every year; and in the West we have discovered that much of the water can be saved and given to the land as it is required.

Moreover, if we have kept our eyes open during these travels, we have seen that almost as much evil may result from a region having too much water as from its having no water at all. We found this so in the Great Dismal Swamp of North Carolina and Virginia and in the Everglades of Florida, as well as upon the lands which are continually flooded in parts of the lower Mississippi Valley. Nearly every state of the eastern half of our country has more or less swamps where the water prevents the use of the land.

Now our government, in the same way as it is reclaiming the deserts, is about reclaiming the swamps. The government engineers are making plans for dikes and dams and great drainage canals, by means of which the waters of these flooded regions can be taken out of them and the lands left dry enough for farming. This is another great undertaking, which, as time goes on, will add enormously to our national wealth.

38. THE FAIRYLAND OF CALIFORNIA

LEAVING Salt Lake, we continue our ride, winding about through the mountains and over the high, thirsty plains. We cross the state of Nevada, noted chiefly for its silver and gold, and then, shooting down the timbered sides of the Sierra Nevada, find ourselves at the city of Sacramento, in one of a series of valleys which make up a great part of the fairyland of California.

A Rose Bush in California.

After our long, dusty ride over the dry, rocky highlands, the change is wonderfully refreshing. There is no section of the United States for which nature has done so much. There are parts of California where it is summer all the year round. The flowers always bloom, and the trees are always green. The people of Los Angeles sometimes

have festivals of roses to celebrate the New Year, and on Christmas they can, if they wish, go out to the shore and take a bath in the ocean, come back and set the table under the orange trees for their Christmas dinner and, in the afternoon, by a short railroad ride, go up among the snows on the tops of the mountains and eat supper under some of the finest Christmas trees in the world.

Our trip through California makes us think of Christmas, for we see again and again many of the things we then find in our stockings. We travel through regions

Almond Trees in Bloom.

where English walnuts hang from the trees, and among orchards loaded with almonds. The oranges here seem even bigger and sweeter than those we ate in Florida. There are lemon trees by the thousands, and we ride for miles through vineyards of the choicest grapes. When we eat

our mince pie or plum pudding at our next Christmas dinner, we may have some of the very raisins which we now see as grapes on the vines. We are surprised to learn that many of the raisin grapes are green in color. They are of the variety known as the white muscat, and they turn purple only when, having been cured and dried in the sun, they become raisins.

Do you like prunes?

California has thousands of trees on which prunes are grown. Prunes are a species of plum; they are far more

Olive Oil Works.

delicious when just picked than when dried and packed away in boxes for sale.

We see olive groves here and there, the trees of which are knotty and gnarly. The fruit looks like green plums, and we make wry faces as we bite into it. Olives must be pickled before they are ready for eating. The fruit is

carefully gathered. Women and men, and often boys and girls, do the picking. Some stretch out sheets under the trees, while others climb up and shake the branches so that the fruit falls down into the sheets. After this the olives are sorted, and those which are large and sound are kept for pickling, while the bruised ones are pressed to squeeze out the oil which we use on our tables for salads.

Olive trees are usually planted in orchards. The trees are first sprouted from cuttings in hothouses, then transplanted, and in seven or eight years they begin to bear fruit. At ten years a thrifty tree should produce five gallons of olives per annum; and when fully grown, it sometimes yields ten times as much.

Have you ever tasted fresh figs?

As they hang upon the trees they are twice as large as when dried and pressed into boxes. They are as sweet as honey, and are delicious with cream. The fig grows well in many parts of California, and we are shown single trees which have yielded a thousand pounds in one year.

During our travels we stop now and then to help the boys gather walnuts. Not black walnuts such as grow so plentifully throughout our eastern states, but the thin-shelled, delicious English walnuts which are sold everywhere in the grocery stores. The English walnut trees are planted and cared for like other fruit trees. They begin to give fruit at the end of six years, but do not come into full bearing until long after that, when a single tree may yield ten dollars' worth of nuts in a year. When the nuts are ripe, they are shaken or knocked down, and then gathered up to be cured and packed for shipping.

The first men who came to California were miners, but after a time it was found that the land would grow not only wheat and other grains, but also more and better

fruits of certain kinds than any other part of our country. All that was necessary to make the driest of soils yield abundantly was water. So large irrigation works were established, and through them California quickly became one of the richest grain farms and fruit gardens of the whole world. The state now has thousands of small farms, many being less than ten acres in size, upon each of which a family makes its own living. In some sections the lands yield so abundantly that an acre will support one or two persons, and the family that owns an orange grove or walnut orchard of thirty or forty acres is quite well-to-do.

You must not imagine, however, that the California farms are all small. The state has some very large ones.

A Vineyard in California.

Take, for instance, the Vina Ranch, which was given by Mr. and Mrs. Leland Stanford to the Leland Stanford Junior University. That farm contains fifty-nine thousand

acres, and you may have an idea of its extent when I tell you that its irrigating canals added together are one hundred miles longer than the distance between New York and Washington.

The Vina Ranch lies north of San Francisco. When I visited it some years ago, I saw thirty thousand sheep nibbling in its pastures, and about them were playing seven thousand lambs that had been born that year. In another place was a drove of two thousand hogs, and there were many hundreds of valuable horses. It takes a large number of people to manage a farm of that kind. There were fifteen hundred men and boys working upon it, and I rode from camp to camp, in different parts of the farm, to see how they lived. They dwelt in sheds, or barracks, many sleeping in one large room. The men of each camp ate together, and their meals were cooked by Chinese. After the day's work was over, they played baseball and other games.

Such a farm is managed like a big business establishment, with account books of various kinds. The cost of everything is put down, and nothing is allowed to go to waste. Every man knows just what he has to do, and the work is divided up into departments.

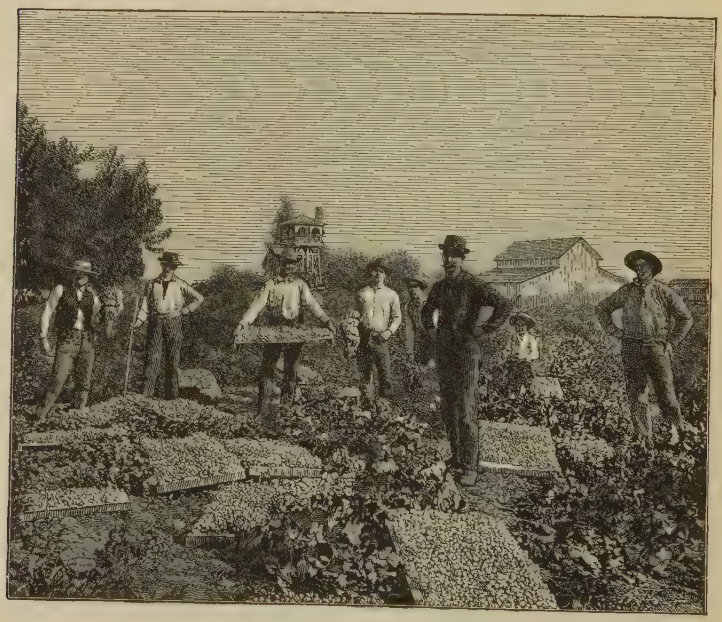
An interesting part of that farm was the vineyard, which was then the largest in the world. It produced enough grapes each year to give a half pound to every man, woman, and child in the United States. If you could imagine a whole county covered with grapevines, you might get some idea of it.

The vineyard was divided into blocks, just like a city, being cut up by streets and cross streets. The grapes were ripe about the first of August, when it required one thousand men and boys to pick them. Two pickers worked

together, each carrying a box, and sorting the grapes as they went from vine to vine, putting the poor grapes into one box and the good ones into another.

Is not this a wonderful state?

Almost anything will grow better in California than in the eastern part of our country. In some sections of it



Gathering Grapes.

beets are raised, one of which will weigh as much as a good-sized boy; and pumpkins have been grown which have weighed up to two hundred and seventy-five pounds, or as much as a full-grown pig. In the southern part of California are elderberry bushes which have trunks from one to two feet in thickness; and at Pasadena is a rose

bush which is said to bear one hundred thousand blossoms at a time.

The biggest trees of the world are to be found on the western slope of the Sierra Nevada. Within one hundred and thirty miles of San Francisco, in Calaveras County, are groves, some of the trees of which are so big that you could build a schoolroom inside one and have space to spare. They are more than three fifths as high as the Washington Monument, and their tops seem to pierce the clouds, for they extend three or four hundred feet above the ground. The "Starr King," for instance, is three hundred and sixty-six feet high, and the "Mother of the Forest" measures three hundred and fifteen feet to its topmost branch, while a half dozen other trees are over three hundred feet high.

A Big Tree.

Many of our own homes are not more than thirty feet wide. There is one of these trees which is forty-one feet in thickness, and if it could be hollowed out, you could build a large house inside its bark. Through the trunk of another a hole has been cut. This hole is so wide that we could easily drive through it in a carriage, and the bark is almost a yard thick.

These big trees are evergreens, related to the cedars. They have foliage much like the cedars of other parts of the country, and the cones which grow upon them are not much larger than a good-sized egg. They seldom

grow by themselves, but among other trees, towering like giants over the smaller pines below. They increase in size as we come nearer, and at last, when we stand under them and look upward, their tops seem almost to touch the sky. It is hard to realize that they were once little sprouts pushing their way up through the ground.

That must have been a long time ago, must it not?

Yes, indeed. The big trees are believed to be the oldest

The Yosemite Valley.

of growing things upon earth. Some of them are twelve hundred years old. They were eight hundred years old when Columbus discovered America; and were enormous trees many years before that time.

These trees are valuable for lumber. The wood is light, soft, and coarse-grained; but it takes a high polish, and

there is so much in a single tree that some have sold for thousands of dollars.

In addition to the Calaveras grove there are other places which have similar trees of great size, all of which Congress has now taken into our national forest reservations, that they may be kept for all time as one of the wonders of the country.

Among other fine trees of this state is the California redwood, which sometimes reaches eighteen feet in diameter, and the sugar pine, almost as thick and frequently more than two hundred feet tall. The state is famous for its fine timber, having more forests than would cover all New Hampshire, Vermont, Massachusetts, Rhode Island, Delaware, and Maryland put together. The National Forest Reserves of California contain more than eight million acres.

Mirror Lake, Yosemite Valley.

Another of the wonders of California is the Yosemite National Park, which lies in almost the center of the state. This park contains the Yosemite Valley, an irregular trough sunken almost a mile below the regions about it. The scenery of the valley is grand, and among its most marvelous features are the Yosemite Falls.

At Niagara Falls we saw the Niagara River making its great drop of one hundred and sixty feet. In the falls of

the Yosemite a branch of the Merced River leaps over the rocks down into the valley. Its first jump is more than a quarter of a mile straight down from the top of a cliff. It then falls a distance of six hundred feet in a series of beautiful cascades, and finally comes to the bottom of the valley.

One of the falls is known as the Bridal Veil. The water of this drops a distance of over six hundred feet, and as it falls it is swayed by the wind and turned to a spray, making it look like a fleecy white veil, which, when the sun strikes it, becomes a sheet of beautiful rainbows.

39. SAN FRANCISCO AND LOS ANGELES

THE largest cities of our Pacific slope are to be found on or near the seacoast at the western ends of the railroads crossing the continent. Most of them have harbors on the ocean, so that goods can be shipped to and from them by sea as well as by land.

At the south is Los Angeles, the terminus of several of our transcontinental trunk railways, with a great artificial harbor belonging to the city. Then come San Francisco with its wonderful bay, reached through the Golden Gate, and north of that, Portland, the chief city of Oregon, near the wide and deep Columbia River, and lastly, Tacoma and Seattle, at the northwestern end of our country on Puget Sound. All of these cities have several railway systems connecting them with the other parts of the United States, and harbors so deep that the largest ocean steamers which sail the Pacific can come to their wharves.

We begin our travels in Los Angeles. The place is so beautiful that it is well named "The City of the Angels." It makes one think of a town built in a botanical garden. It has wide streets shaded with trees, and large parks, in some of which are beautiful lakes. The houses are surrounded by lawns in which grow palms and India rubber trees, as well as bananas and oranges. There are pepper trees with bright red berries, hedges of geraniums and calla lilies which grow out of doors. There are also great century plants and pomegranates; there are immense rose bushes, and in the country wild poppies as yellow as gold. The city is surrounded by irrigated orchards, and we may ride miles in almost every direction without getting out of sight of groves of English walnuts, oranges, lemons, and olives. This is one of the best fruit regions of California. Long trains of oranges and other fresh fruit are always moving from it on their way to the East. There are big nut-packing establishments, canning factories, and other places where dried fruits and raisins are put up for export.

Los Angeles has many fine buildings and comfortable homes. Its climate is so delightful that people from other parts of the United States come here to live, and it has large libraries, fine schools, and excellent stores.

Although in a dry country, it has plenty of water. At an enormous cost its people have built an aqueduct to Owens Lake, which, fed by the glaciers and snows, lies more than two hundred miles away, high up in the mountains. By this means enough water is furnished to irrigate thousands of orchards, and at the same time give Los Angeles more than it can possibly use even though it grow to be many times the size it is now.

Another great advantage the city has is cheap fuel. This

comes from the petroleum fields which lie about and under it, producing vast quantities for export every year. This petroleum is not so good for lighting as that we saw in Pennsylvania; but it makes excellent fuel, and is burned in the engines on the railways and in the homes and the factories. It is also used for sprinkling the roads in the city and country about; so that, ride in our automobiles as fast as we may, we do not raise dust.

From Los Angeles we go by train northward to San Francisco. That city has been called the "Child of the

"We go northward to San Francisco."

Mines." It began to grow as soon as gold was discovered in California. Before that it consisted of only a few shanties on the edge of San Francisco Bay, and its population was not more than five hundred. When the miners rushed in from all parts of the world, about the only gateway to the country by sea was this harbor, and within two years the population of San Francisco rose to twenty-five thousand. Since then it has steadily grown, until now it is one of the largest and most prosperous of our cities. It is an important shipping port, and in its magnificent harbor we find vessels from

Asia, Europe, South America, and Australia, as well as some from the eastern parts of our country. There are great steamers at the wharves ready to sail across the Pacific to Japan, China, and the Philippine Islands; whaling vessels about to start out for the Arctic Seas; ships bound for Alaska; and other craft for the Hawaiian Islands and all parts of the Pacific.

In the San Francisco of to-day we look in vain for the shanties of the past. The sand hills upon which they stood have been long ago cut away, and fine buildings have taken their places. The residence sections are magnificent, for some of the richest men of the United States live here. We ride on cable cars up Nob Hill, by the houses of millionaires; and as we go the conductor points out the homes of men who have made their fortunes out of the mines or from the wheat fields, orchards, and various industries of the Pacific Slope.

During our stay in the city, we see here and there signs of the great earthquake which occurred some years ago, although most of the injury therefrom has long since disappeared, new and better buildings having taken the places of those which were then burned to the ground.

That earthquake was a terrible calamity. It occurred in the early morning of April 18, 1906. The people were still in their beds when the land began to shake. Some of the streets cracked wide open, the chimneys tumbled down, and many large buildings, including the City Hall, fell into ruins. As the earth cracked apart it broke the mains of the waterworks, and in the fires which followed there was no water at hand to extinguish them. The result was that the flames raged throughout the city for several days, destroying the chief business buildings and many of the best residence sections. The loss of property amounted to several

hundred million dollars, and more than four hundred people were killed.

As we go on we wonder if there may not be a second earthquake, and James Whitcomb Riley's little poem comes to our minds: —

> "Where's a boy a-goin',
> And what's he goin' to do,
> And how's he goin' to do it,
> When the earth bursts through?"

However, the people tell us we are perfectly safe, and when we look at the enormous structures which have gone up since the earthquake, we feel they must believe what they say. We spend some time in going about through the city. After visiting the Mint, which is coining great quantities of gold, we take a look at the statue of Robert Louis Stevenson in one of the squares, and then go out to the Golden Gate Park. From there we drive on to the Cliff House to watch the huge sea lions sport about in the water and bask in the sun on the Seal Rocks. Some of them are twelve feet in length, and one weighs half a ton. We can hear them barking above the roar of the breakers.

Returning to the city, we see many strange faces while strolling the streets. The people come from all parts of the world. The most of them are Americans, but there are also many Germans and Irish, Italians, Spaniards, and Jews. There are hundreds of Japanese, some of whom own lands near by and have market gardens. There are more Chinese in San Francisco than in any other United States city. The Chinese have a settlement of their own. It is called Chinatown. It is at the foot of Nob Hill, and covers a dozen or more city blocks, in which are Chinese temples and stores and Chinese houses. The signs of the stores are in characters like those on the tea boxes.

What odd people these Chinese are, and how queerly some of them dress! They have yellow faces and their black eyes seem to be set aslant in their heads. See that boy who stands outside the store over there! His cap is a little round bowl of black satin with a bright red button on top. He wears a full jacket and trousers of dark colored silk, and boots of black cloth. The sleeves of his jacket are so much longer than his arms that he can use them as a muff in winter. We meet many such boys. They stare at us as we ride by. Now we are passing a Chinese temple. We peep in. It is gorgeous with carvings and there are sticks of incense burning on the altars.

Around the corner comes a Chinese woman. Her eyes are aslant and her yellow complexion is painted and powdered. Her head is bare; for Chinese women do not wear bonnets and hats as our women do. They comb their hair into rolls and braids, putting it up in strange ways.

We see more men than women among the Chinese. Most of the men leave their wives and daughters at home, expecting to go back to China some day. The poorer classes do not live so well as the poor of other races in the United States. They pack themselves away at night in large buildings, scores of men often sleeping in one room. They eat the cheapest of food, and save in every way possible that they may soon go back across the ocean to their own dear country on the other side.

In our travels through California and other Pacific coast states we shall find many Chinese. Some are employed as servants, some work in the fruit farms and vineyards, others have laundries, and some have stores in those parts of the cities where the Chinese dwell. Not all are poor. They are thrifty, and many are fast growing rich.

For some time the United States government allowed all

(310) "They stare at us as we ride by."

the Chinese who wished to come to our country. But so many were sent across the Pacific that our people feared they might do all the work, while some good American citizens would be forced to go idle. They found also that the Chinese who came seldom wished to remain and aid in building up the country, and were not inclined to become citizens. Therefore we came to the conclusion that it was best not to have too many of them; and now all ships arriving from Asia are carefully watched, and the Chinese laboring people upon them are not permitted to land.

40. THE PACIFIC NORTHWEST — PORTLAND

WE shall now go by rail from San Francisco to Portland at the western end of several trunk lines of railroads which cross our continent. We leave San Francisco and are soon passing through the San Joaquin Valley, so noted for its wheat crops that it is called the granary of the state. We spend a day in riding about the slope of Mount Shasta, a wonderful snow-capped, extinct volcano, and then go northward into Oregon.

We are now in the Pacific Northwest, which is composed of the rich states of Oregon and Washington. These states have a milder climate than those in the same latitude upon the Atlantic coast. Oregon is warmer than Massachusetts. It seldom snows in Washington west of the Cascade Ranges, and its people have called it the "Evergreen State."

How can this be, and the place be so far north?

It is because of the Japanese Current. You have read

of the warm Gulf Stream, which flows up from the Gulf of Mexico through the Atlantic Ocean. The Japanese Current is a stream of the same kind in the Pacific Ocean. It begins near the coast of China, flows northward about Japan, then crosses to the lower part of Alaska, and flows southward by Puget Sound. Its waters act like a mighty heating plant. They warm the air above them, and this blows over the west coasts of America and especially over the shores of southern Alaska, British Columbia, Washington, and Oregon. For this reason there is but little snow in those regions. Most of the rains which fall are warm, and the moist climate covers the earth with a luxuriant vegetation.

Some of the biggest forests of the United States are to be found in the Pacific Northwest. The standing timber of Oregon is said to be worth several billion dollars, and Washington sells many million dollars' worth of lumber each year. In Washington there are miles of trees, which shoot up as high as a tall church steeple before they put out a branch, and then go upward with branches perhaps a hundred feet higher. Some of these big trees are hollow, and it is said that a Washington farmer used one as a house while clearing his farm. The hole in the tree was twenty-two feet in diameter and forty feet high. A knot hole near the top formed the chimney. He put a floor on the inside eight feet above the earth, and lived there quite comfortably with his family, using the space beneath as a stable for his horse and cow.

Some of the best timber of the world comes from this region. Cedar shingles are made by the million and shipped to the Mississippi Valley, and even across the continent, to roof the houses of the East. The long trees are cut into logs and exported to other countries, and many of them,

sawed into boards, are used in different parts of the United States. There is one lumberyard here which turns out enough boards every year to make a plank roadway as wide as a city street from New York to Boston; and as we ride through the woods we are shown many carloads of boards, a single train transporting enough to pave a walk a foot wide and eighty miles long.

We make an excursion from Portland into the forests, traveling for days through mighty fir trees whose overhanging branches are so thick that they almost shut out the light. Some of the trees are as big around as the Pullman

A Big Oregon Fir Tree Notched for Cutting.

car in which we are riding, and they rise to a height of one hundred feet and more before the branches begin. There are great logs lying on the ground and huge stumps many feet thick.

By and by we leave the train and take a small engine to the lumber camp itself. The work of felling the trees goes on all the year round. There is no snow to float the logs to the streams, and the lumbermen labor summer and winter, using railroads to get them out. They drag the great tree trunks through the forests with ropes of steel and load them by means of engines on to the cars. A single log forty feet long often contains as much as five thousand feet of lumber, forming a full load for one car. It may weigh thirty or forty tons.

We watch the choppers who are cutting the trees. They stand at each side and make a gash in the trunk so large that a man can lie within it. After that the crosscut saw is drawn back and forth, and by and by the giant of the forest falls with a crash to the ground. The tree is so large that it must have been hundreds of years growing. It was long before Columbus came to America when it first made its way through the soil; but these men have laid it low in less than one hour.

We are delighted with Washington and Oregon. Both states are agriculturally rich. They have many large farms which are watered by rain, and thousands of small ones kept moist by irrigation. These states produce fine wheat and oats, large crops of barley and flax, while hops and all the vegetables of the temperate zone can be grown. Both are noted for their delicious apples, peaches, pears, and plums. Oregon makes hundreds of thousands of bushels of prunes every year; and the apples grown here and in Washington are so fine that they command the highest prices in all parts of our country and Europe. We visit orchards, whose trees are loaded with ripe red fruit, and where great piles of apples lie on the ground awaiting the packers.

Great Piles of Apples lie on the Ground.

We spend a few days in Portland, taking the "Seeing Portland Cars" and riding upon them about through the streets. We admire the houses and their gardens, which are filled with flowers. The Portlanders call their town "The Rose City" on account of its beautiful roses which bloom both summer and winter. They are at their best during the first week of June, at which time a rose festival is held.

In one of our excursions we ascend Portland Heights at the west side of the city for a view of Mount Hood, and at the same time away off at the north our eyes catch the snows on the top of Mount Tacoma. Mount Hood and Mount Tacoma are among the grandest peaks of our country. The latter rears its head to an altitude of three miles above the sea, and with its slope it covers twice the

area of Rhode Island. It has upon it about forty thousand acres of ice and snow. It is only fifty or sixty miles from the cities of Tacoma and Seattle, but it seems to be but a short distance away.

From Portland we take a sail up the Columbia River to some of our best fishing grounds. Columbia salmon is sold in cans in almost every grocery store. It is delicious with a little lemon juice, or made into a salad. Fresh sal-

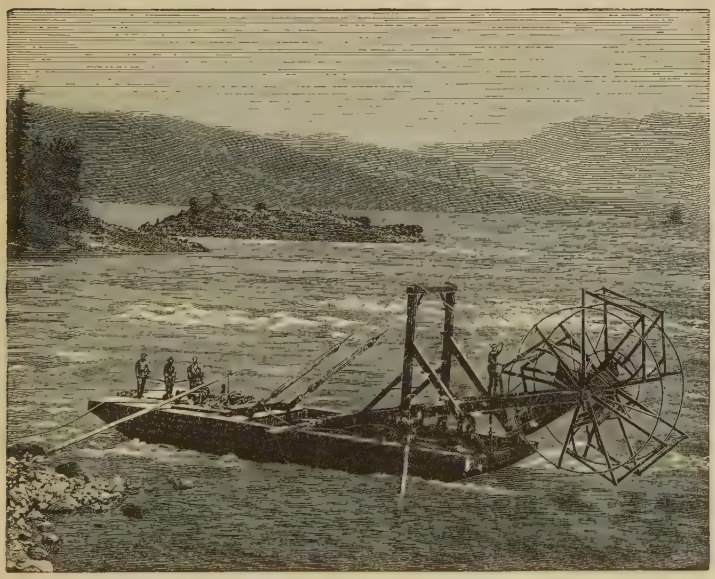
Fishing for Salmon.

mon is far better, and at our breakfast on the boat we order salmon steaks. The fish are so large that they are sometimes served in this form, and we eat great slices of them, which are brought smoking hot to the table.

Salmon spend the most of their lives in the ocean. When full grown they come into the fresh water of the rivers to lay their eggs, and at certain times the Columbia is filled with them. They move in droves and are caught by nets and traps in great numbers. Within the past thirty years

it is said that salmon to the value of eighty or more million dollars have been taken from the Columbia River and vast quantities from Puget Sound. They are cooked and canned and sent to all parts of the world. It takes only three ordinary salmon to fill four dozen one-pound cans.

The fishermen are for the most part white men, although a few are Indians. At some places, along the river where



Fish Wheel.

the current is swift, wide fish wheels, much like mill wheels save that wire nets are fastened to their rims, are used. Such a wheel is attached to the stern of a boat which is so anchored that the current keeps the wheel turning. As the nets strike the water the fish are caught in them and the wheel lifts them up and slides them down into a trough,

through which they fall into the boat. One night, not long ago, a wheel of this kind, fastened to a vessel, caught fifteen tons of fish, so many that their weight sunk the boat. This, Oregon people say, is a true fish story.

41. PUGET SOUND AND THE INLAND EMPIRE

RETURNING to Portland, we again take the cars and ride a day northward to Puget Sound. This great body of water is sometimes called the American Mediterranean. It is almost entirely surrounded by land, and several of the finest mountains of our country look down upon it. Its shores are well wooded and it has many fine harbors. Indeed, Puget Sound is so deep that ships can sail almost anywhere in it. It teems with fish of which it has about one hundred different kinds fit for eating.

Our first stop is made at Tacoma on Commencement Bay, within plain sight of the grand white cone of Mount Tacoma and the Cascade Range. This is a thriving city with sawmills, furniture factories, foundries, and smelting works. It has an excellent harbor and carries on an extensive trade in grain, lumber, coal, tea, and silk.

From here we take the electric cars and go on to Seattle, the largest city upon the Sound and one of the most thriving industrial centers of the United States. Seattle is at the end of several great lines of railroad, and some of the biggest ships which sail the Pacific start from here with grain, lumber, and other products for Asia. It is also the chief port for Alaska, and to it are brought the vast quantities of gold mined in that country.

We find Seattle a city of ups and downs. It has more hills than Rome, and its best houses stand on several long ridges which rise from Puget Sound to a height of three or four hundred feet. Many of the hills have been cut down, and the earth composing them has been thrown into the low lands, making more space for building.

Seattle is a thriving manufacturing city. It has more than a thousand establishments of various sizes which

At the Wharves of Seattle.

make things to sell, and among them are smelting works and rolling mills, shipyards, and all kinds of factories for turning out lumber. The Puget Sound region has more than fifteen hundred sawmills, and these make several billion feet of boards and more than seven thousand million shingles a year.

An interesting thing about Seattle and the other cities of the Pacific Slope is the use they make of the waterfalls

which drop down the steep mountains. They have harnessed them to machinery, and, by the electricity so developed, run all sorts of factories, some of which are miles away. There are many falls in California which are so used. We have seen how Owens Lake benefits Los Angeles. Seattle uses a force equal to that of many thousand horses all pulling at once, which comes from the Snoqualmie Falls; and the electric railroad which connects it with Tacoma is also moved by water.

If we should cross over the Cascade Mountains to the city of Spokane, lying in Washington about a day's ride to the eastward, we should find that it is lighted by the falls of the Spokane River, which runs through it. The river plows its way to the city through a mighty gorge and then dashes down fall after fall for a distance of one hundred and thirty-two feet within less than a quarter of a mile. The waters rage and foam as they drop from level to level, sending up a spray which the sun turns to diamonds. This is right in the city. At the side of the river great pipes have been put in, and the water has been so conducted through them that it falls upon great wheels which generate electricity. In this way the river not only lights the city, but turns its mills and factories and moves the electric cars both in the city, and far out into the country.

Spokane is one of the most thriving of the interior towns of our West. It is surrounded by a rich farming country, and not far away are gold, copper, silver, and other mines. It is sometimes called the metropolis of the Inland Empire, by which is meant a vast region lying east of the Cascade Mountains, comprising much of Idaho and Oregon and a large part of eastern Washington. This equals in extent all the New England states, together with New York, New Jersey, Pennsylvania, and Maryland.

This territory was once a vast sea, hemmed in by the mountains, which finally broke forth and flowed off through the canyons which now form part of the Snake and Columbia river valleys. Surrounding the sea and within it were volcanoes which vomited ashes, making a soil which, when the water was taken out, was exceedingly rich. For a long time the land was supposed to be too dry for farming, but it is now found to produce excellent wheat, and it has become one of the most valuable parts of our country. It has fine orchards, and it produces grain by the millions of bushels a year.

We spend some time in this region, making long journeys up the Columbia River, and going off to the mines in the mountains about. We then return to Spokane and take a side trip several hundred miles to the eastward to see something of the wonders of the Yellowstone National Park before returning to Seattle to go to Alaska.

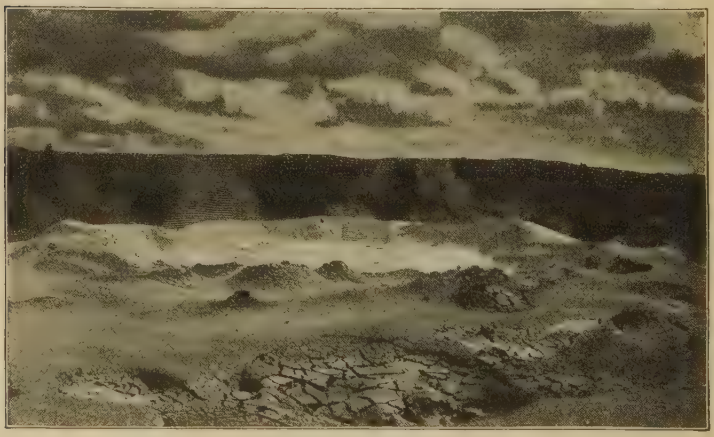
42. THE YELLOWSTONE NATIONAL PARK

YOU must not think the Yellowstone Park is a little place because it is called a park. It is really as big as some of the smaller kingdoms of Europe, and is almost as large as the state of Connecticut. It is owned by the government, and Congress has decided that men must never use it for farming, but that it must be kept as a national reservation, belonging to you and me and the other people of the United States in common.

This great park, at its lowest point, is about a mile above the sea; and it has mountains about it which are more

than two miles in height. Its surface is a rolling plateau, parts of which are covered with woods, while in other places are high cliffs and deep, yawning canyons.

The Yellowstone Park is full of natural wonders. It is a region of geysers. It has five hundred hot springs that are always boiling up water and mud, which contain differ-



View in Yellowstone Park.

ent minerals. As the water falls back, it leaves a sediment which in time builds up wonderful structures of all colors of the rainbow.

There is one hot spring which has thus formed a white hill about it more than two hundred feet high. As the water flows out of the top of the hill, it falls into one semi-circular basin after another built up by the sediment. Some of the basins are only a few inches deep, and others have a depth of six or eight feet. The mineral matter crystallizing from the water has painted upon the sides of these basins all the shades of blue, scarlet, green, and yellow. It has frescoed some portions with lace work, and

given others the appearance of having been embroidered with beads. At the top the water is boiling hot. It grows cooler as it falls from basin to basin; so that, starting at the bottom, we could have a bath at any temperature by merely walking up to the top.

What would you think of a spring flowing mineral paint? There is such a spring here in the Yellowstone Park, which

Hot Springs.

covers more than an acre. It boils and boils, looking like a mighty paint pot over a furnace unseen. The paint is of all colors, and it bubbles like hot mush on the fire.

Another fountain is always vomiting forth masses of green, slimy mud mixed with sulphur. The smell of that spring is so sickening that one must put his handkerchief to his nose as soon as he comes near it.

The geysers are hot springs which from time to time throw enormous bodies of boiling water and steam into the air. Some spout every year or so, and others every few minutes. The Grand Geyser, the greatest in the world,

throws up a volume of steam and boiling water to a height of three hundred feet; and "Old Faithful" sends up every hour an immense volume of steam and boiling water as high as a very high church steeple. Old Faithful keeps spouting for several minutes, and the water falls back in clouds of steam and spray. There are other geysers which spurt forth mud, and some which build up stony foundations about them, formed of the minerals contained in the water.

Old Faithful.

Another wonder of this park is the Yellowstone River and its canyons. At one place the waters of the river have a fall of three hundred feet, or almost twice that of the American Falls at Niagara, and they go through a gorge far more wonderful. The walls are a third of a mile high, and the rocks which compose them are of such colors that the river seems to flow between walls of precious stones. There are tons of rock as white as crystal, other tons which shine like amethyst, and here and there rocks which glitter like diamonds as the sun strikes them. Halfway down the walls of the canyon are ledges upon which eagles have built their nests; and if

we look carefully we may perhaps see the young eagles in them.

These are only a few of the strange features of the Yellowstone Park. We hardly dare describe them for fear our friends at home may think of us as they did of a preacher who once visited this region, and afterward gave a lecture upon it to his congregation. The people listened

The Fish Pot.

quietly until he told them he had stood upon a rock beside the Yellowstone Lake, and caught a fish; and then, without moving, had given his fishing rod a twist and had thrown the fish, still hanging to the hook, into a boiling spring behind him and cooked it. As he said that, one of the deacons arose, and asked the pastor to stop right there, saying, "We have listened to-night to bigger stories than we have ever heard in our lives before; but that last one is too much — too much!"

The story, however, might easily have been true. Yel-

lowstone Lake is as clear as crystal. Its waters are cold, and are filled with fine fish. Upon its eastern shore, only a few feet away from the edge of the lake, there is a deep boiling spring called the Fish Pot, and one standing there might catch a fish, and easily cook it without changing his position.

Falls of the Yellowstone.

It is now time for us to return to the Pacific coast and we decide to go back to Seattle. We pass through the mining regions of Montana, where many millions of dollars' worth of silver and gold are obtained every year. We stay a while at Butte to visit the famous Anaconda Mine, from which thousands of tons of copper ore are shipped daily, about the largest output of copper of any mine in the world. We cross Idaho at its narrow part, following for twenty-five miles the northern shore of beautiful Lake Pend d'Oreille, and, before reaching Puget Sound, pass through the Puyallup Valley, celebrated for its hop fields.

The cultivation of hops is one of the industries of the state of Washington. During the hop harvest as many as five thousand Indians come on ponies from beyond the mountains, or in canoes up Puget Sound, to find employment in the fields. The picking is done by the Indian women and children, while the braves look on and smoke.

A Hop Field.

The average crop of hops in Washington is about eight million pounds and is worth more than one million dollars.

43. AMONG THE INDIANS

WE find Indians at the railroad stations in many parts of the West. They have come to sell us pottery, baskets, and buffalo horns, and purses and moccasins made of skins embroidered with beads. How sober they look as they stand about with their merchandise in their hands! Their faces are of a reddish or copper color. That is why they are called the red race. They have high cheek bones, straight noses, black eyes, and long, coarse black hair. Both men and women part their hair in the middle.

But where are the feathers which we usually see on the

Ute Indians, Colorado.

Office of Indian Affairs.

Indian's head in the pictures? Very few Indians wear feathers in their hair in times of peace. They now dress much like white people, except that some of them have gayly colored blankets over their shoulders. The men wear soft hats, but the women have their heads bare, or covered with a shawl.

Some of the women carry curious bundles on their backs. The bundles look like bags, or boxes, made in the shape of a little coffin. There, a woman has turned about, and we can see her bundle more plainly. Notice the hole in the top and the odd little brown head peeping out. That is a papoose or an Indian baby. See how sober it is. It turns its head but it does not cry. Indian babies seldom cry, although you might think that being squeezed and cramped would make them do so. When the mother goes home, she takes the baby off her back, and stands it still in its cradle up against a log or the side of the house until she is ready to take it again.

A Papoose.

Where did the Indians come from?

When Columbus discovered America, there were Indians all over this continent. They were the only inhabitants on this side of the world. There were not many of them,

and it is said that all those of our country numbered less than half as many people as there are now in Philadelphia.

When our forefathers settled along the Atlantic coast they got some land of the Indians by making treaties with them. Then there were Indian wars during which they took more land; and, step by step, the white men crowded the red men westward. We made other treaties, by which we paid the Indians for their lands, until now all they have left is but a small part of the territory originally occupied by them. This land is chiefly in the West, and a large part of it lies in the Rocky Mountain region. It is in scattered tracts, called reservations, each, in most cases, occupied by one tribe of Indians. Many of the reservations are small, consisting of but a few hundred acres, and others are as large as some of the smaller states of the Union. All together, the lands so set aside contain many millions of acres. They are scattered through a great part of the United States west of the Mississippi River. Some tribes have given up a part of their reservations for sale to the white settlers, and the Indians live upon the remainder which the government has divided into smaller tracts and given to them individually. This land is held in trust for the Indians until they show themselves competent to manage their own affairs and during the trust period it

Indian Chief — Black Bear.

cannot be disposed of without the consent of the government.

Are there different kinds of Indians?

Yes, indeed; all the Indians are by no means alike. If the boys of the different tribes were to come together, they could no more understand one another than we could understand the children of Germany, France, or Italy. There are more than two hundred different Indian dialects spoken, and the only way some tribes have of communicating with other tribes is by signs.

Indian Chief — Ochohisa.

There is also a great difference in the customs of the tribes. Some are more civilized than others. Most of the Indians who once lived east of the Mississippi now reside on the western reservations, and engage in farming and stock raising, or other peaceful pursuits of civilized life. The Indians have a great deal of property. In 1914 our government estimated the value of their possessions at nine hundred million dollars. Some of this was in agricultural lands and some in forests. Some was in oil lands and some in mineral lands of other kinds, while a great deal was in money that had been received from the sale of the Indian lands and deposited in the United States Treasury for them.

In former times the Indians were dangerous and cruel foes. They hid behind rocks and bushes, and when cornered would fight to the death. A warrior was held in great honor. To-day all such things are done away with, and our government is gradually civilizing even what were formerly the most primitive tribes. But the early Indians were also strong and brave friends, and often proved of great help to the white settlers in many ways.

The Indians are fond of their children. They teach them to be brave and to endure severe pain without crying or flinching. In many of the tribes boys are taught to hunt and fish. They learn to paddle canoes, and both boys and girls play about in the water. Nearly every tribe has some strange customs relating to children. For instance, the Chippewas of Minnesota choose their own names. When a boy arrives at the age of twelve or thirteen, he finds, some morning, a bowl of charcoal placed before him instead of his regular food. He knows what this means. He must go off into the woods and fast. He remains in the woods until he falls asleep, and if during his sleep he dreams of some animal, he chooses the name of that animal as his own name, and that animal is considered his guardian spirit.

In some parts of the Southwest are Indians whose forefathers were farmers long before Columbus discovered America. The Hopi Indians and others of New Mexico and Arizona have always had towns, and very odd towns they are. Often you will see a little flat-topped hill rising seven or eight hundred feet above the rest of the country. Upon these the Indians built their houses in the early days, because there they were safe from wild animals and also their enemies, and they continue this practice to the present day.

They make the houses of stone or sun-dried bricks, and build one on top of another, in great terraces, or steps, so that they can climb on ladders from house to house. In some of the pueblos or towns there are no doors to the first house, and one has to go up a ladder and get on the roof before he comes to the ground floor. To reach the second house, one must enter from the roof of the first, and so on.

A Pueblo.

The roofs of the lower houses form the playgrounds of the children above. In many of these towns the dogs and cats, as well as the children, climb up and down ladders and steep stone steps, going with the greatest ease from roof to roof.

Many of the Pueblo Indians are farmers. Some of them have large peach orchards, surrounded by stone walls to

keep out the sheep and goats. They raise apricots, watermelons, and also corn, beans, and pumpkins. They make blankets, baskets, and pottery; and are in many other ways quite civilized.

The Navajo (nav'-a-ho) Indians have thousands of horses and hundreds of thousands of sheep. They are industrious and frugal. They live in little round huts made of poles covered with earth, which have holes in the top for chimneys. Some most beautiful blankets are made by the Navajo women. They are woven by hand and sometimes sell for as much as one hundred dollars apiece.

A large number of Indians live in what was once the Indian Territory, but which is now a part of the State of Oklahoma. This territory was set aside more than fifty years ago, and Congress hoped to make it the home of all the Indians. As it is now, much of it is owned by the five civilized tribes, — the Cherokees, the Chickasaws, the Choctaws, the Creeks, and the Seminoles. Many of these Indians are more civilized than some of our white people. They have beautiful houses and large and prosperous farms. They have schools and churches. The tribal form of government is gradually being abolished.

The Cherokees have an alphabet, and their books are printed in their own language. Many of the men of these civilized nations marry white women, and the Indian girls often marry white men.

For a long time our government has been trying to educate and civilize the Indians. We have an Indian Bureau connected with our Interior Department at Washington, and the head of this is the Commissioner of Indian Affairs. Superintendents, who report to him, are placed in charge of every reservation; and through them the Indians are regularly supplied with certain amounts of

food, clothes, cattle, horses, and farming tools. Formerly everything was given to the Indians free, but now all except the sick, aged, and disabled must perform labor for what they get or pay for it in cash on the easy payment plan. Upon some of the reservations irrigation works have been established, and on others mining of various kinds is carried on. Some of the Indians have sawmills, and a great many have farms of their own, supporting themselves.

Our government does all it can to make the Indians useful citizens. It regards the red men, women, and children as pupils in a great school, embracing the various reservations, and it has a force of something like six thousand men and women to teach them. It has established several schools for the education of Indian boys and girls similar to the one we saw at Hampton.

There are day schools for pupils from the first to the fifth grades situated near the homes of the Indians. Here the children study the same things that we do, and the boys are taught also gardening and manual training, while the girls learn sewing and housekeeping. Lunch is served at many of these schools. There are also boarding schools, some on the reservations and some at a distance from them. The children live at the boarding schools and go home only during the summer vacations. These schools have classrooms like ours and have also workshops where the boys learn to be carpenters, masons, printers, tailors, and harness-makers. Some study plumbing and others learn to be engineers. If a boy has no land, he is advised to learn a trade. By these means nearly all of the Indians have become more or less civilized. They have adopted the white man's clothing, and there is but little doubt that in time all will be cultivating their farms or earning their living by other work as we do.

44. ALASKA

OUR next few weeks are to be spent in Alaska (p. 341), that great territory which forms the northwestern end of this continent. It is separated from the main body of the United States by the vast extent of British America, and as we look at it on the map, it seems far away. Its northern coasts are within the Arctic Circle; and at the west it goes so close to Asia that, were Bering Strait frozen over, we could cross by reindeer sledges within a few hours, and be upon Russian soil in the land of Siberia.

Until 1867 Alaska belonged to the Russians. They then sold it to the United States for seventy-two hundred thousand dollars, and it is now an important part of our country. It was bought through William H. Seward, who was then Secretary of State. At that time many of our people thought the land contained nothing, and that it was always buried in ice and snow, and they raised an outcry against the purchase, calling it "Seward's Folly." Since then, as we shall see during our travels, Alaska has brought us in a vast deal of money. It has produced furs, fish, and minerals worth many times its cost, and we would not now sell it again for hundreds of millions.

The area of Alaska is enormous. It would make more than twelve states as big as New York, or more than seventy the size of Massachusetts. The whole of New England could be put into one of its corners; and all together it comprises about one sixth of all the land of our country.

Alaska has high mountains and great rivers; and at the north are vast tundras, or marshy, frozen plains. The mountains are snow-capped, and down their sides move mighty glaciers which make a noise like thunder as they break off and fall into the sea. Some of the mountains

are volcanoes. Mount Wrangell is always throwing out fire and vapor, and Pavloff, at the western end of the Alaskan Peninsula, sometimes bursts forth into terrific explosions which shake the country for miles about. The Aleutian Islands, which extend like stepping stones from the southern part of this territory almost to Asia, are largely volcanic; and in Bering Sea volcanoes have risen out of the water, thrown masses of heated rock and clouds

"Alaska has high mountains and great rivers."

of steam into the air, and after a few years sunk back again. The land is one of hot springs, including some on Seward Peninsula, near Nome, which are health resorts.

Is not this a strange country, with its vast fields of ice, and its mountains of snow, out of some of which burst hot

springs and blazing volcanoes? We scarcely know what to expect, and are at a loss as to what clothes to take. Our friends have told us that Alaska is so cold that one needs a fur sleeping bag to keep from freezing at night, and others say that parts of the country are as warm as Virginia. We shall find that both statements are true. Alaska has different climates in its different parts. Most of it is covered with snow during a greater part of the year. Northern and central Alaska have long, dark winter nights and long, bright summer days. In some regions the frost never comes out of the ground. Near Nome, on the Seward Peninsula, a shaft was recently sunk one hundred and twenty feet, and down to that depth the ground was frozen. In the tundras there is always ice below the thin soil, although the latter thaws out in the summer.

Upon the other hand, a great part of southern Alaska, including the region about Sitka and the Aleutian Islands, is so tempered by the winds from the warm Japanese current that their climates compare with those of the best parts of our Union. There the winter weather is much like that of Washington, or St. Louis, and in summer it seldom grows hotter than eighty-seven degrees Fahrenheit.

The vegetation of southwestern Alaska compares with some countries of northern Europe. It has forests as tall and almost as dense as those of Louisiana or Florida. There are wild hops, wild onions, and wild berries of many kinds. The raspberries are delicious, and at the entrance to Glacier Bay, on Strawberry Point, there are so many wild strawberries that when they blossom the land looks like a field of daisies, and when they ripen, the berries fairly make the ground red. There is high grass on the islands of southern Alaska; and even along the Arctic Ocean, dandelions and buttercups blossom in July and August.

During the short summer the sun shines all day and about half of the night, so that vegetation grows much faster than in the lands farther south. The Yukon Valley is covered with grass in the summer, and beautiful ferns, wild celery, and wild parsnips grow. There are many wild berries and great beds of red and purple flowers. The banks of the streams are often spotted with iris blossoms, and the edges of the lakes and ponds are bordered with bright yellow lilies. There are trees almost everywhere in Alaska, although as one goes northward they grow shorter and shorter, until, on the tundras, they fade off into swamps.

Alaska is a land of great rivers. The Yukon, which divides it almost in half, is one of the large streams of the globe. It rises beyond the Canadian boundary and flows towards the west in the shape of a bow, a distance about as great as from New York to the Mississippi River, before it empties out through Norton Sound into Bering Sea. In places it is ten miles in width, and its watershed comprises almost half the country. The Kuskokwim is another large river.

In addition to the rivers are the fiords, where the ocean runs into the land. We shall see many of these during our steamer trip northward, traveling for a thousand miles or more in and out among islands, by and through these high-walled waterways. In some fiords steep cliffs rise on each side, and they are so narrow that the sunlight seldom gets in except during a few hours at midday. It is almost always twilight in such places. The air is moist, and the walls of the cliffs are so wet that they are green the year round.

At the ends of some of these fiords are glaciers, and as we go on northward we shall see many of these mighty

rivers of ice which are slowly moving down the mountains and breaking off in great blocks into the sea. Glaciers are found in Alaska in greater magnificence than anywhere else in the world. The high, steep mountains condense the water-laden winds from the ocean, and the snow falls in great quantities.

Upon the western slope of Mount St. Elias, eleven enormous blocks of ice are moving down towards the

A Glacier — Alaska.

ocean. One of them is fifty miles long and twenty miles wide, and another, as we observe it from the steamer, ends in a wall of ice two hundred feet high and five miles in width, stretching back into the country as far as our eyes can reach. About Sumdum Bay are one hundred or more of these frozen fields which are always dropping off ice into the ocean. We can hear the thunder of the

ALASKA
SCALE OF MILES
0 100 200 300 400 500
Longitude from Greenwich
East 180 170 West 160 150 140
160 170 180 170 160 150 140 130 120
60
ARCTIC OCEAN
PACIFIC OCEAN
BERING SEA
ASIA
SIBERIA
ARCTIC CIRCLE
Anadir Sea
C. Deshnev
Pt. Barrow
Icy Cape
C. Lisburne
Pt. Hope
Kotzebue Sound
Kotzebue Strait
SEWARD PEN.
C. Prince of Wales
Nome
Solomon
Norton Sound
St. Michael
ST. LAWRENCE I.
C. Romanzof
ST. MATTHEW I.
NUNIVAK
C. Newenham
PRIBILOF IS.
ALEUTIAN ISLANDS
ATTU
AGATTU
RAT IS.
ANDREANOF
ATKA
AMLIA
UNIMAK
UNALASKA
FOX IS.
SHUMAGIN IS.
KODIAK I.
GULF OF ALASKA
Nushagak
Bristol Bay
Kuskokwim
Yukon
Koyukuk
Kobuk
Noatak
Colville R.
Endicott Range
Porcupine R.
Great Bear Lake
Mackenzie R.
NORTHWEST TERRITORIES
YUKON TERRITORY
KLONDIKE
DAWSON
REGION
Circle
Fairbanks
Tanana R.
Mt. McKinley
Alaskan Mts.
Mt. Wrangel
Valdez
Mt. St. Elias
Mt. Logan
Kluane L.
White Horse
BRITISH COLUMBIA
Atlin L.
Glacier Bay
JUNEAU
CHICAGOF
SITKA
BARANOF I.
PRINCE OF WALES I.
Dixon Entrance
Prince Rupert
QUEEN CHARLOTTE IS.
Cook Inlet
KENAI
Seward
Iliamna L.

masses as they fall from the glaciers into the water. At the same time there is the roar of the cataracts, falling down the sides of the mountains; and the granite walls of the cliffs about are streaked with cascades.

The Alaskan glaciers are surpassingly beautiful. The ice is of the purest blue, and as we go by them on ship-board, they seem like huge walls of sapphire. They look as though they were great torrents of water which the wand of Jack Frost had turnd to ice as they were about to plunge into the sea.

Take the Muir Glacier, for instance, which faces the ocean on Glacier Bay. If you could make Niagara Falls three times as wide as they are, and double their height, and then freeze the whole mass of water to ice as it falls, you might have some idea of this wonderful glacier. You must, however, imagine a background of snow-clad mountains three miles in height, and a bright sun which, as it strikes the ice wall, turns it to opals and diamonds and lights up the icicles so that they shine with all the hues of the rainbow.

It is terribly interesting to watch the glaciers as they break off and fall into the sea. The noise makes us tremble; the spray flies into the air; the water boils; great waves roll out on every side, and a few moments later a huge iceberg rises to the surface. In traveling through these seas we are seldom out of sight of icebergs, and our captain is careful to have his ship out of the way when a glacier breaks off and an iceberg is formed.

As we make our way northward along the coast, we now and then see an Indian village. The Indians live close to the sea because they get their living by fishing, and also on account of the forests, which come down to the edge of the water. Many of the towns consist of but one row

of wooden huts, in front of which stand carved posts called totems. These totems are thirty or forty feet high, and they make us think of a forest of dead trees until our ship comes closer, and we can see the houses below them. They are carved with representations of different animals and birds. Upon some are bears, quails, and eagles; and others have grotesque figures of men. They may be called the coats of arms, memorial posts, or genealogical trees of the natives, and are not idols, as has been supposed.

Totem Poles.

At every stop of our steamer the Indians bring us beads, moccasins, and carved things for sale. At Wrangell we meet some Tlinket squaws. These Indians blacken their faces, and the women wear plugs of iron, wood, or bone in their lower lips. We see also Aleuts farther on in our travels. They are the Indians of the Aleutian Islands, whose huts are half underground. They subsist largely on fish and are fond of whale blubber.

Still farther north, and along the coast of the Bering Sea and in the basin of the Yukon, are Eskimos belonging to some other strange tribes which inhabit the Arctic regions of the North American continent. They are shorter than our Indians. They have coarse, black hair, black eyes, high cheek bones, and broad, flat noses. They

(344) Eskimos.

dress from head to foot in furs, having fur hoods which they draw over their heads. In the coldest regions many of them have a second garment of fishskin, which they wear over the furs. The fishskin garment is considered very desirable; for, in case of necessity, its owner can eat it. Both men and women often wear pieces of bone and ivory in their lower lips and noses, and many tattoo their faces.

The Eskimos live, for the most part, on fish and seals. They are fond of all kinds of fats, and it is said that they will eat tallow candles if they have no other food. A missionary who traveled through Alaska tells us that he had great trouble keeping his castor oil, for the natives looked upon it as a delicious foreign drink. He had to limit his prescriptions to one dose at a sickness, and would never allow a patient to have more than four tablespoonfuls at a time.

In summer many of the Eskimos dwell in skin tents, and in winter they often make a tent of blocks of pure ice, stretching their summer tent of skin over the top as a roof. They keep their houses a little warm with stove lamps, but as a rule rely chiefly upon their clothing for heat. They travel from place to place upon snowshoes, carrying their household goods on sledges drawn by dogs or reindeer. The reindeer were imported some years ago from Russia, and there are now thousands of them. They are valuable for transporting all kinds of goods and for their meat, milk, and skins. We take a reindeer ride during our stay. It is bitter cold, and we are clad in reindeer hoods and coats of reindeer skin with the fur turned inward. The great animals are harnessed to a sled in which they drag us over the snow up hill and down dale at the rate of ten miles an hour.

45. ALASKA — FISH, FURS, AND MINERALS

THE chief things for which Alaska is valuable to the United States are its furs, fish, and minerals, and they have long since repaid us the original cost of the country. Alaska is one of the great fur lands of the world. It has sea otter so valuable that a single skin will bring the hunter a hundred dollars or so, and a fine overcoat lined with such furs will sell for as much as two thousand dollars. Since we bought Alaska of Russia, we have sold otter skins to an amount much greater than the price we paid for the territory. We have caught many beavers, minks, and foxes, and have sold millions of dollars' worth of skins of the fur seal.

The fur seal is among the queerest of animals. It is a huge creature, the males often weighing five hundred

Seals.

pounds, and the females one hundred or more. It has beautiful eyes of bluish hazel or black, which change in expression when it is angry; and its mouth and jaws are not unlike those of a Newfoundland dog, save that the lips are pressed tightly together. The seal has flippers

under his body. Those at the shoulders look like a pair of black hands, the arms of which are concealed under the skin, and the hind flippers take the place of legs and feet. It has two coats of fur, a short, crisp, bristly one of long hair and underneath that a soft, close one of a downlike fur. It is the fur that makes the skin valuable, and it is only the under coat that is kept when the sealskin is cured.

One of the strangest things about the seal is the summer trip which he makes to Alaska. He looks upon certain islands as his summer home, and goes there every year. During the winter he lives in the warm waters of the Pacific Ocean, far south of Bering Sea; but in spring he starts northward, swimming on and on, until he reaches the four little Pribilof Islands. There are many thousands of seals. They come at about the same time and climb upon the rocks, remaining there until cold weather drives them again to the south.

It is upon these islands that the young seals are born. The old males come first, and pick out the spot where they are to live with their families. After a few weeks the females are seen swimming in, and soon the island is covered with little colonies of these curious animals, each colony keeping to a certain extent to itself.

The baby seals make us think of young dogs, and their cry is like the bleating of a lamb. The mother's call to her little ones is similar to that of a sheep, and the babies play together like puppies. When they are about six weeks old, they go into shallow pools and learn to swim; and as they grow stronger, they roll down into the sea and take excursions of miles. The seals are so valuable that men are allowed to kill only a few of them each year. The ones chosen are males from three to four years old. They

are not hard to catch. They have no fear of man, and can be easily driven off in herds or droves, apart from the others. The seal hunters carry clubs about seven feet long and as thick as a baseball bat. They stun the animals by striking them on the skull, and then other men come along with sharp knives and kill them.

The skins are now taken carefully off, and piled up with layers of salt between them. After being thoroughly

Sitka, Alaska.

salted, they are done up in square bundles and shipped to London, where all sealskins are dressed. This is done by shaving the skin very thin. This cuts off the roots of the stiff hairs which form the outer coat, but does not touch those of the downy fur below. The long hairs are now

brushed off, and the fur is dyed black or a rich brown, just as we see it in sealskin coats.

During our stay on the Pribilof Islands we have a talk with the fur traders. They tell us that the seals are fast disappearing, although the United States government does all it can to protect them. We cannot, however, control the English, Japanese, and Russian hunters who watch for the seals as they go back and forth to the islands, and kill them while they are swimming through the ocean. In 1867, when we took possession of Alaska, as many as five million seals came to the islands. A few years later there were only three millions, and the number which now comes is only a hundred thousand or so, and it grows less year by year.

On our way up the coast of Alaska we pass many salmon canneries and see vessels going in carrying supplies to the fishermen and taking out salmon for shipment to all parts of the world. More than one half of the salmon of the United States comes from these waters, and thousands of men are engaged in the business. The catch now sells for millions of dollars a year; and it is eaten not only in our country but all over the world.

Alaska has also cod, halibut, trout, herring, smelts, and other food fishes. Of these the cod is the most valuable. It is caught with hooks by the Indians, who use other fish as bait. There is also a fish which is rather rich for eating; but which, according to Major General Greeley, who spent a long time in Alaska, is used by some of the natives for lighting their houses. This is the candle fish, which is so oily that when a wick or pith is stuck in its back it will, when lighted, burn like a candle.

The chief resources of Alaska, however, are neither furs nor fish; they are minerals. We know something of what

the fish and furs amount to, but a large part of the mineral territory is yet to be explored, although vast quantities of gold have been discovered, and we know that there are large deposits of coal, copper, and tin. Millions of dollars' worth of gold are now being taken out of the sand and earth during the short summers, and thriving

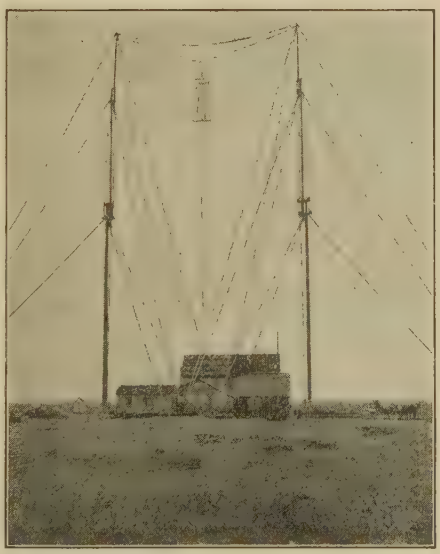
Washing Gold.

little cities have grown up to supply the miners, many of whom, with their wives and children, now live there all the year round. Within the past thirty years almost two hundred million dollars' worth of gold has been taken out of Alaska, and in some single years we take out twenty millions and more.

During our travels we visit Cape Nome, a great gold-mining camp on the shores of the Seward Peninsula; and while at a bank ask to see some of the precious metal recently washed from the sands. The cashier points to a

canvas bag which lies on the floor of the vault and asks us to lift it. It cannot hold more than a peck, and the task seems very easy. We try and almost break our backs in the attempt. He then opens it and shows us some nuggets, one of which is worth three thousand dollars, and others, each worth a thousand or more. The little lumps of metal have dirt clinging to them, but aside from that they are pure, yellow gold.

Leaving the bank we visit the mines, and later on travel up the Yukon and go to other parts of the country where they are washing out gold. There are some quartz mines, but much of the gold comes from placer deposits being washed out of the earth near the streams. Most of such work must be done in the summer, for the ground is frozen about two thirds of the year. In the winter fires are built upon the soil containing the gold, to take out the frost; and the gold-bearing earth is carried to the streams and piled up there to wait until summer comes to give water with which to wash the gold out.



United States Wireless Telegraph Station, Port Safety, Alaska.

The quartz mines of Alaska will some day produce a vast deal of gold; and the country has mountains which con-

tain copper and such enormous deposits of coal that it is said they will in time supply a large part of the fuel used in the lands which border the Pacific Ocean. The territory is being rapidly developed. The important towns are already connected by telegraph lines, and there are wireless telegraph stations by which messages are sent across country. Several railroads are building, including one which is being made by the United States government.

There are already thriving little cities and towns, such as Nome, Fairbanks, Juneau, and others. These settlements are lighted by electricity, and they have telegraphs and telephones. Many of them have daily newspapers, and in all are excellent schools. In the northern towns, in the summer, the children dress much as we do; but in the long winters they are clad mostly in furs, and their fur coats have fur hoods which they pull over their heads to keep Jack Frost from biting their ears.

46. BRITISH AMERICA—TRAVELS IN THE FUR LANDS

THERE are several ways by which we can go from Alaska into British America. We might sail from Nome back to Puget Sound, taking eight or nine days to reach Vancouver, and thence go across the southern parts of British America by the Canadian Pacific Railway, or we might go to Prince Rupert, which is to be the terminus of the Grand Trunk Pacific Railway, and travel through the mountains to Edmonton and thence on to the east. We prefer, however, to continue our journey in the north lands of

the continent, and shall sail up the wide Yukon River through Alaska, and thence tramp across the passes of the Rocky Mountains to the Mackenzie River. (Map, pp. 360–361.)

The steamers on the Yukon are comfortable, and we enjoy the crisp air as it blows down the stream. After some days of travel we leave the river and, loading our camping outfit on dog sledges, make our way upon foot. Now we stop to look at the beaver dams upon some of the streams, now to hunt deer or caribou, and again to fish in the brooks for supplies for our outdoor meals. By and by we reach the Mackenzie and travel for some time upon it, going through the Great Bear and Great Slave lakes and down to the Arctic Ocean. Our next long trip is back up the stream and then on east through the forests to Hudson Bay. Finally, after a series of long weary journeys, we turn back to the southward into the more settled parts of the Canadian Dominion.

These travels are interesting, and especially in the far northern parts of the continent. There the trees are stunted by the cold, and most of them are only two or three feet in height. We find them taller as we go southward, and at last we reach a long forest belt which extends from British Columbia to the Atlantic Ocean. We remember the great firs and cedars almost as tall as the highest church steeple which we saw upon the shores of the Pacific as we made our way north to Alaska, and we are now told that this forest reaches clear across the continent from ocean to ocean. British America has the greater part of the trees now left on our Grand Division, and from Hudson Bay to the head of Lake Superior is one continuous forest.

Most of the northern regions belonging to the British are as wild as they were when our Pilgrims landed at Plymouth and began to cut down the woods. We often travel for days

without seeing a white human being. Now and then we meet an Indian and again some Eskimos in furs. There are, in all British America, only about one hundred thousand Indians, scattered over the country in wandering tribes. The white population, including the cities, is by no means

Trading Post — Hudson Bay Company.

large in comparison with ours, and here in the Far North there are few whites excepting the agents of the Hudson Bay Company and other fur traders.

These traders are often our hosts as we go on our way. Each has a little store filled with the goods which the Indians like and for which they exchange the furs and skins they get in their trapping and hunting. Most of them belong to the Hudson Bay Company, which for more than two hundred years has controlled the fur trade of British America. This company has grown rich by trading with

the trappers and Indians, and it still has its agents scattered throughout the fur countries.

The Hudson Bay Company was organized in 1670, when King Charles II gave it the exclusive right to trade with the Indians in the Hudson Bay basin. It was composed of some English noblemen and others who put their money together to send out ships and men to collect these valuable furs. They began about Hudson Bay, but rapidly extended their business until they controlled the whole territory from Labrador to the Rocky Mountains and from the western parts of the United States to Alaska and the Arctic Ocean, employing hundreds of agents and traders, besides many Indians. Of late years they have given over most of their land to the government, which has sold it to the settlers for farms. They are still trading for furs in the wilds.

The Canadian Dominion is one of the best fur lands of the world. It has bears, minks, foxes, wolves, and deer in its forests and beavers and otters in its rivers and lakes. Millions of skins are yearly bought by the traders and shipped to New York or London, where they are prepared for the markets of the world. The fur trade with the Indians is carried on by barter of which the unit of account is the beaver. One beaver pelt is worth a certain number of martens, and the skin of a silver fox is worth many beavers. The Hudson Bay Company sends out blankets, beads, knives, and other such things to their traders, and the Indians know just how much they should get for each skin.

The agents tell us that they are often a year without seeing a white man. This is especially the case with those near the coast of Hudson Bay, who are visited by ships from Great Britain only once a year. The ships enter the

bay in July bringing supplies; and they leave for London about the middle of September loaded with skins and furs.

In our long northern journey we find no lack of either game or fish, and we live on what we shoot on the way. Now and then we kill caribou or small deer, and sometimes lay in a good stock of meat by shooting a moose.

A Moose.

Moose hunting is by no means child's play. Many of the male deer of this species are eight feet high, and their enormous antlers are often so large that from tip to tip they measure six feet. The best time to hunt moose is in the winter. Our Indian guides go with us and show us a moose yard. This is a spot in the swamps where the moose have their regular feeding grounds. We follow the tracks in the snow, putting on snowshoes in which we can run rapidly, while the moose, being heavy, will sink down through the crust and cannot escape.

Now we are near the yard. We hide behind the trees with our guns at our shoulders. The Indian guides call the moose by imitating its cry, and soon a great creature is seen making his way through the snow. He is suspicious and sniffs the air; but the wind is blowing towards us and he cannot scent our presence. We aim carefully, and bring him down at first shot. Had we not done so the great beast might have turned upon us and crushed us with his horns. The big moose is a fierce fighter

when wounded, and for that reason it is best to have a repeating rifle in hunting such game.

In the western parts of British America are panthers, grizzly bears, and mountain sheep. The grizzlies stay in the gloomiest of the Rocky Mountain regions. They are enormous beasts, and those who hunt them take their lives in their hands. Mountain sheep are found high up in the hills, above where the grizzlies live. They are sure-footed, jumping from rock to rock; and are exceedingly difficult to kill.

A Grizzly Bear.

Canada has excellent fishing. Its lakes and streams are alive with fish, and we catch all sorts of the finny tribes, from the sweet-fleshed brook trout to the great salmon which weighs as much as a good-sized baby.

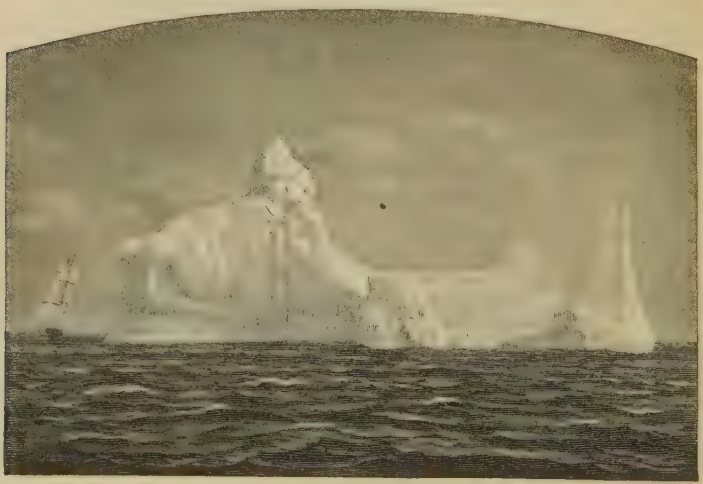
Had we time to spend a summer in the Arctic Ocean, about the mouth of the Mackenzie, we might even catch whales, for that is one of the best whaling grounds of the world. The steam whale ships, which we saw at the San Francisco docks, go to the mouth of the Mackenzie, and often winter there, being frozen in the ice.

In former times whales were caught chiefly from sailing vessels. As soon as the seamen got near enough to a whale, they threw a harpoon, with a rope attached. The sharp, arrowlike head of the harpoon stuck into the whale's flesh, and the great creature struggled about until it was tired out and could be killed. It was cut up in the water, and the huge pieces of blubber were raised to the ship's deck, to be made into oil.

Now much whaling is done by little steamers which carry cannon, from which the harpoons are shot into the whales. To the harpoons are attached ropes, the other ends of which are tied to the ships, and it is not a hard matter to kill a whale when once the harpoon is in him.

Whales are also caught off the coast of Greenland and in Hudson Bay and also along the shores of Labrador and and in the Gulf of St. Lawrence. They are valuable for their bones as well as for oil. The whalebone is taken from the mouths of the whales.

You have heard of the banks of Newfoundland. With the exception of Alaska, perhaps, they are the greatest



Icebergs.

cod-fishing grounds that have ever been known. Under the sea just south of the island of Newfoundland, there is a plain about two hundred miles long and seventy miles wide, where codfish, herring, and mackerel come by the

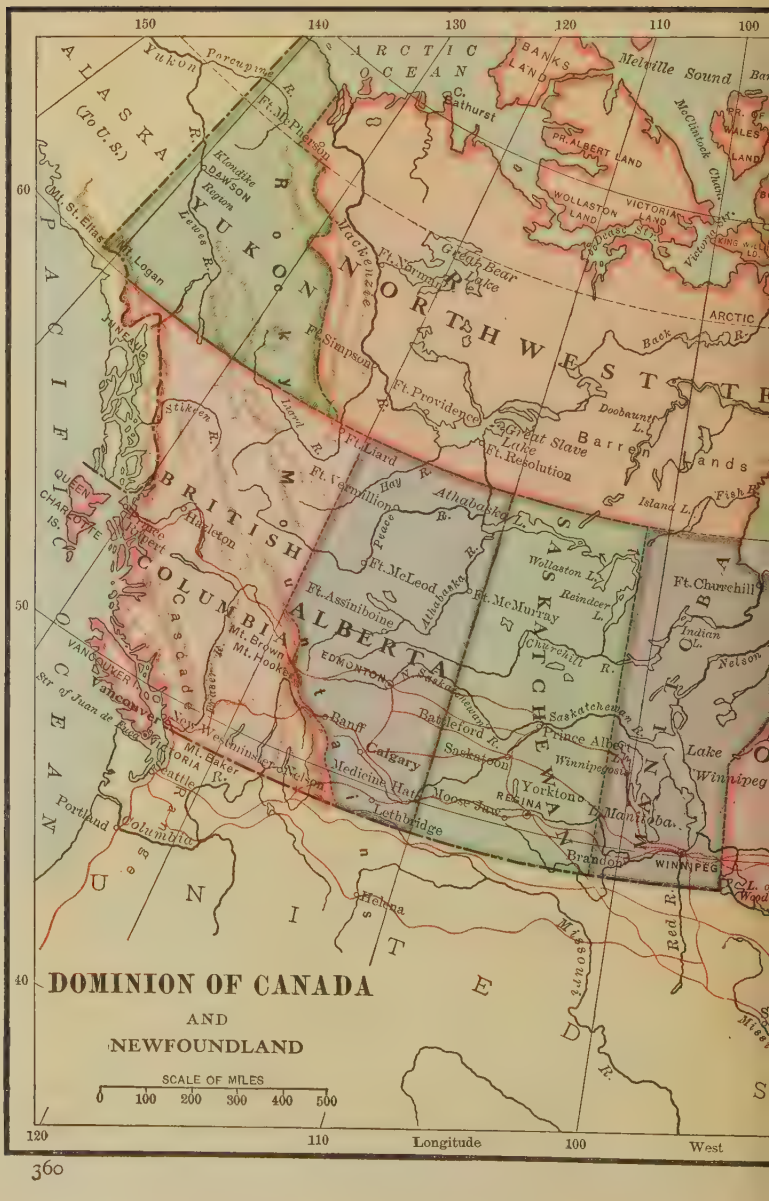
millions to feed. These fishes are fond of cold water, and the Arctic Current, which washes the coast of Labrador, brings down a slime containing sea life, which forms their favorite food. The waters there are covered the greater part of the time with fogs. Now and then huge icebergs float through them, and the fishing is exceedingly dangerous.

Still, many vessels go there, and more codfish are caught on the Grand Banks, as they are called, than anywhere else in the world. So many are taken that if the dried codfish exported in one year should all be sent to the United States, there would be more than enough to give every man, woman, and child of us a pound and a half. Much of our best mackerel comes from Canada; and an army of fishermen is engaged in catching herring in nets, and in smoking, pickling, or curing them in other ways.

47. BRITISH AMERICA—THE SETTLED REGIONS

THE Dominion of Canada, the name by which British America is generally known, comprises all the territory between the United States and the Arctic Ocean, with the exception of Alaska, and Labrador and the Island of Newfoundland. Newfoundland belongs to Great Britain, and Labrador is dependent upon it; but neither is directed by the Canadian government.

But without these two latter countries, the Dominion of Canada is one of the largest bodies of land owned by any one nation. It is almost as big as Europe and is


DOMINION OF CANADA
AND
NEWFOUNDLAND
SCALE OF MILES
0 100 200 300 400 500
ARCTIC OCEAN
PACIFIC OCEAN
ALASKA
(To U. S.)
YUKON
NORTHWEST TERRITORIES
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
UNITED STATES
Yukon R.
Porcupine R.
Ft. McPherson
Klondike
DAWSON
Rogue
Lewes R.
Mt. St. Elias
Mt. Logan
Mackenzie R.
Great Bear Lake
Ft. Norman
Ft. Simpson
Liard R.
Ft. Providence
Great Slave Lake
Ft. Resolution
Back R.
Barren Lands
Ft. Vermillion
Hay R.
Athabaska R.
Peace R.
Ft. McLeod
Ft. Assiniboine
Ft. McMurray
Wollaston L.
Reindeer L.
Cherchill R.
Ft. Churchill
Indian L.
Nelson R.
Island L.
Fish R.
Stikeen R.
Lynn Canal
Skeena R.
Hazleton
Cascade Mts.
Mt. Brown
Mt. Hooker
Rocky Mts.
EDMONTON
Battleford
Saskatchewan R.
Prince Albert
Lake Winnipeg
Banff
Calgary
Medicine Hat
Moose Jaw
Saskatoon
Winnipegosis
Yorkton
REGINA
Lake Manitoba
Brandon
WINNIPEG
Red R.
Lethbridge
Helena
Portland
Columbia R.
Mt. Baker
Vancouver
VANCOUVER I.
QUEEN CHARLOTTE IS.
Str. of Juan de Fuca
Victoria
Seattle
Melville Sound
BANKS LAND
Cathurst
PR. ALBERT LAND
WOLLASTON LAND
VICTORIA LAND
McClintock Channel
PR. OF WALES LAND
Victoria Str.
ARCTIC
Doobaunet L.
Longitude
West
150
140
130
120
110
100
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40

80
70
60
50
40
30
BAFFIN BAY
GREENLAND
(To Denmark)
Davis Strait
DISKO I.
BYLOT I.
COCKBURN LAND
MELVILLE PEN.
Fox Channel
CUMBERLAND PEN.
Cumberland Sound
Kennedy L.
LUKE FOX LAND
HALL PEN.
SOUTHAMPTON I.
META INCOGNITA
RESOLUTION I.
Hudson Strait
C. Chidley
C. Farewell
Payne L.
Ungava Bay
Ramah
Nain
LABRADOR
Boundary Undefined
Ft. Chimo
Str. of Belle Isle
Hamilton R.
Big R.
James Bay
East Main R.
QUEBEC
NEWFOUNDLAND
St. John
C. Race
Ft. Albany
Moose Factory
Rupert House
ANTICOSTI I.
Gulf of St. Lawrence
L. St. John
PR. EDWARD I.
CAPE BRETON I.
Sydney
Str. of Canso
NEW BRUNSWICK
CHARLOTTE
Height of Land
QUEBEC
FREDERICTON
St. John R.
NOVA SCOTIA
HALIFAX
C. Sable
Ottawa R.
Montreal
St. Lawrence R.
Sault Ste. Marie
Sudbury
OTTAWA
Georgian Bay
L. Huron
Kingston
L. Michigan
TORONTO
L. Ontario
Portland
Boston
Buffalo
Detroit
L. Erie
Cleveland
New York
ATLANTIC OCEAN
POATES ENG. CO., N.Y.
from
80
Greenwich
70

bigger than Australia, or the main body of the United States with the addition of Alaska. It has provinces and territories of enormous extent. The two territories — Yukon and the Northwest Territories — lie between sixty degrees north latitude and the Arctic Circle, including also the icy islands at the north. Their chief inhabitants are wild animals. These territories are almost half as large as the United States proper, comprising more than one third of the Dominion of Canada. Some of the southern provinces which form the cultivated portions of the country are also enormous. Quebec is ten times as big as Missouri, Ontario and British Columbia are each ten times the size of Indiana, while Manitoba, Saskatchewan, and Alberta are each greater than France or Germany in size.

This vast territory is rich, although its people altogether are not so many as those of the state of New York. Most of its inhabitants live in the southern provinces of the Dominion bordering on the United States. These provinces compare favorably in climate and resources with our states just over the boundary. They have large cities, and are rapidly growing in agriculture, manufacture, and commerce. Many railroads are building, and the more settled regions are connected by prosperous trunk lines, including some which extend from the Atlantic to the Pacific. This is so of the Canadian Pacific Railway, and it will soon be so of the Grand Trunk Pacific which crosses the country some distance farther north. Another extensive system which is pushing its way through the western part of the country is the Canadian Northern.

But suppose we start at Victoria, the capital of British Columbia, and travel on eastward. We are now on Vancouver Island, on a fine harbor overlooking the Strait of Juan de Fuca (hoo-än′ dā foo′kä) and the Gulf of Georgia,

with the Pacific Ocean almost at our feet. Here the people are chiefly English-speaking Canadians, although there are many Japanese and Chinese who have stopped here on their way from China and Japan to the city of Vancouver.

Victoria has fine stores and comfortable homes. We visit the public buildings which overlook the harbor, and then go out on the electric cars to Esquimalt, one of the British naval stations on the Pacific. Here we see large gunboats at anchor, and examine the dry dock where these huge vessels are cleaned of the barnacles that fasten themselves to their hulls. A man-of-war lies within the dock, and we watch the sailors scouring and scraping it clean.

Dry Dock — Esquimalt.

At Victoria we take passage upon a little steamer and cross the Gulf of Georgia to Vancouver, Canada's principal port on the Pacific. A ship has just come in from Asia, and we watch the men unload tea and silk and other goods from China and Japan and put them in the cars upon the railroad which is to carry them east.

We do not stay long in Vancouver. It is a delightful little city situated on the mainland in sight of the great white cone of Mount Baker. It has wide streets, beautiful parks,

and many fine buildings. It owes its growth to its position on this excellent harbor at the end of the Canadian Pacific Railway. There are trains for the East leaving daily, and we might take a through passage and go clear across the continent in the same car. The distance, however, is over twenty-nine hundred miles, and we conclude to buy our tickets from place to place and stop as we please.

Our first travels are in British Columbia. The country along the track is well wooded, the fir trees in some sections rising to a height of three hundred feet. Shortly after leaving Vancouver, we skirt the Fraser River, whose sands are said to be mixed with gold dust, and then go onward and upward into the heart of the Rockies.

The scenery of British Columbia is grand. We ride for miles in the snow. We fly past glaciers and great fields of ice. Now we are down in the valleys with pine trees on both sides of the train. And now we climb the mountains again. At last, after a day or so of travel, we are over the range and descending the lower slopes of the mountains which are covered with green.

We stay for a few days at Calgary, a thriving city corresponding somewhat to Denver as to its situation in the foothills of the Rockies. It lies at the western end of the prairies and owing to the warm winds of the Pacific which blow over the mountains, it has a mild and healthful climate, being less cold in the winter than the lands farther south. This city is supported largely by the miners and farmers about. Near it is a vast tract of irrigated country which contains thousands of small farms and there are large grazing ranches near by. There are railroads going northward from Calgary, and we travel northward all day to Edmonton, a thriving city, passing through rich farming lands all the way. We learn that the province of Alberta,

where we now are, as well as Saskatchewan and Manitoba farther east have some of the best wheat soil of the world.

For a long time western Canada was thought to be worth little, but a few years ago the fertility of the soil was discovered and it has now become an agricultural empire and one of the bread lands of the world. It has been rapidly settled and is already one of the most important parts of British America. Railroads have been built in every direction, cities and towns are growing up, and it will some day have a large population.

Throughout the northern part of the wheat belt and indeed in almost all sections of British America, we find order well kept. The settled portions have policemen as

"The Mounted Police ask each Farmer if all is right."

we have at home; and on the frontier and in the wilds are the mounted police who go about upon horseback asking each farmer and trapper if all is right in his neighborhood,

and seeking out and bringing to justice those who do wrong, These men are fine fellows and we enjoy chatting with such of them as we meet.

Continuing our journey by the Canadian Pacific Railway we travel through many fine farms and cattle ranches as we cross the province of Alberta and stay awhile at Regina, the capital of Saskatchewan. There are huge elevators near the railroad, and at the station we see the farmers unloading wheat into the cars.

We see more and more wheat as we go on into Manitoba, and at Winnipeg stop at one of the chief grain centers of North America. Winnipeg is the capital of Manitoba. This province contains the northern part of our Red River Valley, which we visited after the trip up the Mississippi River. The soil of the valley is rich and it yields millions of bushels of grain every year.

Winnipeg is a fast-growing city with many big elevators and flourishing mills. It is the key to the prairies and it commands the trade of the regions to the north and west. All the trunk lines from the Atlantic to the Pacific pass through it and railroads are now planned to connect it with Hudson Bay. When they are constructed, ships from Europe can come through Hudson Strait during midsummer, and by crossing Hudson Bay be within a few hundred miles by rail of the wheat belt. When that is done this city will be the Chicago of Canada.

Leaving Winnipeg, the cars take us to Port Arthur and Fort William on Lake Superior at the head of Canadian navigation of the Great Lakes. This is a thriving milling and manufacturing center with so many elevators that it might be called the Minneapolis of British America. We spend some time here watching them loading and unloading.

wheat. We go through the huge vessels which are to carry the grain down to the seaboard, and are told that most of it will be sent across the Atlantic to Europe.

We might get a boat which would carry us on through the Lakes by way of the Welland Canal to Montreal; but we have already made the most of that journey in an American steamer on our way down from Duluth to Buffalo and we decide to take the train instead. Our first few days are through a wild broken region during which we cross rapid rivers and skirt numerous lakes. As we go on we find more and more woods, and we realize the extent of the forests of Canada when we are told that the belt of timber extends several hundred miles to the north. We stop over for a day at Sudbury to see the great nickel mines there, and then continue our travels until at about thirteen hundred miles from Winnipeg we reach the city of Ottawa.

Ottawa is the capital of the Dominion of Canada. It is a beautiful place and somewhat similar to Washington, although far less in size. Like our national capital, it was cut out of a forest. It is situated on a high bluff at the junction of the Rideau and Ottawa rivers, and as we stroll through its wide streets we can hear the murmur of the Chaudiere Falls, which here break the navigation of the Ottawa, giving water power for numerous sawmills and factories making wood pulp, paper, and other things.

At the highest part of the city, almost overhanging the river, are the Parliament Houses where the laws for the Dominion are made, and near them the department buildings where the cabinet ministers and their clerks keep the books of the government.

It is at Ottawa that the Governor-General of Canada lives. He is appointed by the king of England and receives a salary of about fifty thousand dollars a year.

He has a number of advisers or cabinet ministers much as our President has; and it is his business to carry out the laws of Canada as enacted by the Parliament of the Dominion. He is expected to do just as Parliament says; so that, although the country is nominally ruled by him as the representative of the king, it is really governed by the people themselves through their representatives here. The upper house of Parliament is called the Senate, but it differs from

Parliament Buildings — Ottawa.

our Senate in many respects. The Canadian senators are chosen for life, ours for six years. Each province of Canada has the right to a certain number of senators, but the men are selected by the Governor-General instead of being chosen by the people, as with us.

The House of Commons is somewhat like our House of Representatives. Its members are elected by the people. Each representative receives twenty-five hundred dollars

a session; and if he be absent he is fined fifteen dollars a day for the time he is away, unless his absence is caused by illness. Parliament fixes the taxes of Canada, and directs how the money received from taxes is to be spent. It is all used in Canada, and is not sent to Great Britain as was the case with the taxes paid by the American colonies before the Revolution.

Each of the provinces of Canada has a government somewhat like that of our states, but Parliament deals with the whole of the Dominion and not with any special province.

The two largest cities of Canada are Montreal and Toronto. Toronto is situated on Lake Ontario with a magnificent harbor. It is a beautiful city noted for its fine buildings and comfortable homes and also its universities and schools, as well as for its extensive trade and large manufacturing establishments.

Montreal is the New York of Canada, the chief commercial city and also the chief seaport. It is situated on an island formed by the junction of the Ottawa and St. Lawrence, and we can reach it by a sail down the Ottawa in the steamers which in the summer go every day from one city to the other. The journey can be made in three hours by rail.

Although the city is five hundred miles from the mouth of the St. Lawrence, large ocean liners ascend to it. The Lachine rapids prevent their passage farther up the river.

Landing in Montreal, our first stroll is along the wharves which line the St. Lawrence for more than a mile. Great ocean steamers are going out and in, and we see immense cargoes of grain, which have been brought down the Great Lakes through the Welland Canal, being loaded for Europe. Formerly the ocean steamers which came to

Canada stopped at Quebec, because the river channel west of that city was only eleven feet deep; but in 1851 the people began to dredge out the St. Lawrence. It is now over

Wharves at Montreal.

twenty-seven feet deep, and the large vessels from Europe sail right up to Montreal. By this means it is several hundred miles nearer Liverpool by sea than is New York, and hence has a large trade.

Leaving the river we now go to the top of Mount Royal for a look at the city. This hill is just behind Montreal. It is about three hundred feet high and is reached by an inclined railway much like that on which we went up Mount Washington. The view is magnificent. At the southeast and southwest we can see our own green Adirondacks with their peaks kissing the sky. Below us lies Montreal with its wide streets bordered by trees, its mighty churches, and its many factories and enormous grain elevators. The wide,

silvery St. Lawrence flows far below us, and right in front is the Victoria Jubilee Bridge belonging to the Grand Trunk

"The Hill is reached by an Inclined Railway."

Railway. It is an open-work steel bridge, built in 1898, with double tracks, carriageways, and foot walks for pedestrians, and rests on the piers which held the famous Victoria

Victoria Jubilee Bridge.

wrought-iron tubular bridge which was built in 1859. The piers are stone pillars, the upper sides of which extend out into the river in the shape of great plowshares. That is to cut the ice as it rushes against them in the spring.

The St. Lawrence is frozen during most of the winter. The snow falls heavily in Canada, and in some years Montreal has a winter festival, during which the people build a huge palace of ice blocks which strangers come thousands of miles to see.

In Canada winter is the jolliest time of the year. The snow lies upon the ground for months. There are skating, snowshoeing, and tobogganing. Every city has its skating rink, many of which are lighted by electricity. Every town has its snowshoe club, each of which has its own uniform, consisting of a bright-colored blanket coat, and a hood or cowl fastened to the neck that it may be drawn up over the head. The clubs run over the snow, playing games in the moonlight. As they play they sing, and the sight is a strange one.

Tobogganing is enjoyed by men, women, and children. A toboggan is a thin piece of board about eighteen inches wide and from four to eight feet in length. The board has

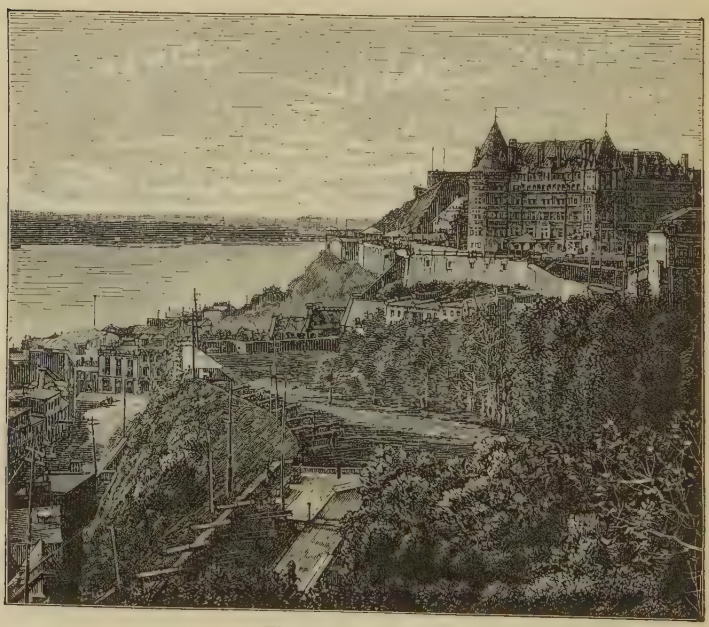
a very smooth bottom and is turned up at the front end. When placed on the edge of a hill, with one or more passengers seated upon it, it will rush over the glassy snow with the speed of an express train. The steersman always sits in the rear. It is his business to direct the course of the board with his hands and feet. He sometimes makes a mistake, and turns himself and the others in front of him upside down in the snow.

Tobogganing.

In our travels through eastern Canada, we are surprised to find that so many of the people are French. In the province and city of Quebec there are more French than English, and in all Canada a large proportion of the inhabitants are of French descent. We hear little else than French spoken on the streets of Montreal, and going to the government offices find that all official notices are printed in both French and English. The signs over the stores are in the two languages, and there are daily and weekly newspapers printed in French. The markets are supplied with vegetables by French-Canadian farmers, with whom we talk in the French language.

For a long time the eastern part of Canada was a possession of France. Then a great war was fought between

the French and the British, and in 1759 the British soldiers under General Wolfe climbed to the heights upon which the city of Quebec is built and captured it. They conquered the country, and in 1774 Canada was formally annexed to the British Empire. It is still a dependency of Great



The Citadel, Quebec.

Britain, although, as we have seen, its people practically govern themselves.

We are interested in the stories we hear of the fight at Quebec, and steam down the St. Lawrence to have a look at the city. The town stands upon a rocky bluff three hundred feet above the river, and is so well fortified that it has been called the American Gibraltar. It has cannon

upon the rocks near the city, and there are forts on the heights of the opposite bank so that it would be dangerous for a foreign battleship to try to pass through and go up the St. Lawrence.

The place where the battle between the French and English occurred was the Plains of Abraham, just back of the city. As we go over it our guides tell us that both of the commanding generals were killed during the engagement. General Wolfe, the head of the British forces, fell dead on the field, having been shot three times, the last ball piercing his heart. General Montcalm, the leader of the French, was first struck by a musket bullet and then by a discharge from the only cannon possessed by the British. Mortally wounded, he was carried into Quebec, and at five o'clock the next morning he died. All this happened on September 13, 1759. Soon afterwards the French rule in North America came to an end.

Quebec is more like an old French town than a modern American one. It has many narrow streets which climb their winding ways up hill and down. The people are quiet, and as we go through the town we can hardly believe that it belongs to our hustling, bustling North America. One of the modes of conveyance is by the calash, a two-wheeled, one-horse vehicle, the bed of which rests upon springs on the shafts.

A Calash.

We take a calash and ride through the lower town, visiting the French market, and then climb the hills to have a

look at the public buildings, convents, and churches. We stroll upon Dufferin Terrace, a grand promenade running along the edge of the cliffs more than two hundred feet above the St. Lawrence, and then go to the citadel to look at the great fortifications and watch the drill of the soldiers.

Our next trip extends still farther eastward. We take the railroad, and soon find ourselves in Halifax, the capital of Nova Scotia, where there are other fortifications and a naval station manned by Canadians. We enjoy the city and its odd sights. The air is pure and the fresh breezes of the Atlantic, flavored with salt, make us desire to be at sea again. There are steamers at the wharves, and we have no trouble in finding one to carry us southward, to Boston. From there we go again to New York and take passage upon a ship for Vera Cruz, the chief seaport of Mexico.

48. SPANISH NORTH AMERICA — MEXICO

MEXICO is within a few days' ride of any part of the United States, but the two countries differ so that, as we land in Vera Cruz, we seem to be in another world. The faces of the people are darker than ours. They speak Spanish, and we must have a guide who understands English to take us about. Some of the men wear hats with brims a foot wide, and bands of silver and gold as thick as your wrist. Not a few have on jackets, or short coats, embroidered with silver, trousers ornamented with silver buttons, and leather belts from which silver-mounted revolvers hang. The ladies we see on the streets are clad all in black; and some have lace shawls over their heads, like those worn by the women of Spain.

The poorer people have features somewhat like those of our Indians; but they are shorter in stature, and do not look so strong. They are dressed in cotton. The men wear big hats, and not a few have red blankets which they drape picturesquely about their shoulders. The women wear cotton dresses, and have shawls on their heads in place of hats or bonnets.

A Mexican.

What queer houses we see in the towns! Their roofs are flat, and there are very few chimneys. The people use charcoal for cooking, and here at Vera Cruz it is so hot that one does not need a fire to keep warm. How gay the walls look! They are painted a bright red, yellow, or blue. They extend to the edges of the sidewalks, and the ground-floor windows have iron bars like a prison.

How beautiful the flowers and trees are! We are now in the tropics. There is a tall coconut palm, and that long-leaved plant beside it is loaded down with bananas.

Mexico is a part of Spanish North America. For centuries all the country between the United States and the Isthmus of Panama belonged to Spain. The Spaniards came over the Atlantic and conquered the Indians, and divided up their lands among themselves. Some of them married Indian women, and to-day Spanish North America is inhabited by the descendants of the Spaniards, by those of the Spaniards who married the Indians, and by those of the Indians who lived here at the time Columbus discovered America. The different countries, however, long ago re-

belled against Spain; and they are now independent, and have their own governments.

The Republic of Mexico is almost one fifth as large as our country, including Alaska. Take your map of North America, and observe the shape of Mexico. Does it

Straw Cottages — Mexico.

not look much like a great horn, the roots of which are fastened to the United States, with the tip ending in Yucatan, on the coast of the Caribbean Sea?

Mexico is like a horn also, in that it slopes very steeply upward from the sea on both sides, its top forming a high, irregular plateau, which in most places is more than a mile above the surface of the Gulf of Mexico or the Pacific Ocean. It is on the inner curve of the horn that we land at Vera Cruz.

A country so shaped must have many climates. We realize this as our cars climb up the railroad from the coast to the plateau. Along the coast it is exceedingly hot and

110°
100°
90°
30°
20°
UNITED STATES
MEXICO
PACIFIC OCEAN
GULF OF MEXICO
CARIBBEAN SEA
Gulf of Campeche
Gulf of Tehuantepec
LOWER CALIFORNIA
GULF OF CALIFORNIA
SONORA
CHIHUAHUA
COAHUILA
NUEVO LEON
DURANGO
TAMAULIPAS
SINALOA
TEPIC
ZACATECAS
SAN LUIS POTOSI
JALISCO
MICHOACAN
GUERRERO
OAXACA
CHIAPAS
MEXICO
QUINTANA ROO
YUCATAN
CAMPECHE
BRITISH HONDURAS
GUATEMALA
HONDURAS
NICARAGUA
BELIZE
CUBA
HAVANA
TROPIC OF CANCER
Yucatan Channel
C. Catoche
C. San Lucas
C. Corrientes
REVILLAGIGEDO IS.
El Paso
Juarez
Hermosillo
Guaymas
Chihuahua
Culiacan
La Paz
Mazatlan
Durango
Monterey
Saltillo
Laredo
San Antonio
Houston
Galveston
New Orleans
Mobile
Matamoros
Tampico
Ciudad Victoria
Zacatecas
Aguascalientes
San Luis Potosi
San Blas
Tepic
Guadalajara
Leon
Guanajuato
Queretaro
Irapuato
Celaya
Morelia
Colima
Manzanillo
Tehuacan
Puebla
Orizaba
Jalapa
Veracruz
Progreso
Merida
Campeche
Santa Cruz de Bravo
Oaxaca
Acapulco
Chilpancingo
Tehuantepec
Salina Cruz
Tuxtla Gutierrez
San Juan Bautista
Rio Grande
Pecos R.
Mississippi R.
Balsas R.
SCALE OF MILES
0 100 200 300 400 500
110° Longitude West 100° from Greenwich 90°
379
PCATES ENG. CO., N.Y.

unhealthful during a great part of the year, and especially in the rainy season, when the water falls in torrents. We ride for miles through groves of palm trees, in the tops of which bunches of coconuts hang. We pass thickets of bamboo canes, whose feathery branches extend high above the roofs of the cars. Here are mahogany trees and ebony trees; and there are vines bearing vanilla beans, from which comes the extract we use in flavoring ice cream, soda water, and cake.

The forests are full of curious flowers; hundreds of air-plants hang to the branches; and there are so many choice orchids that we could have a carload for the picking. Birds of bright colors fly about through the trees, and mocking birds whistle at us as we go by.

We soon reach the hills, and begin to go upward. The ascent is so steep that a double engine is used. In one place we rise a thousand feet in twenty miles, and in another four thousand feet in twenty-nine miles. The engine puffs and groans as it pulls us about the sides of the mountains. It drags us through tunnel after tunnel, hauling us over bridges, now twisting this way and now winding that, until at last, after having elevated us more than a mile and a half above the sea, it lands us at Esperanza. We are now far above the sea and at the beginning of the plateau which forms the greater part of Mexico.

A Double Engine.

In our trip upward we have gone through a half-dozen different climates. We first rode through groves of orange and lemon trees. We passed by fields of pineapples, the

red bodies of which shone out below the green leaves against the dark earth. Pineapples grow in the ground much like cabbages, and those that the Indian women bring to the cars, fresh and ripe from the fields, are far more delicious than any sold in our markets. They are so soft we eat them with spoons.

A little farther on we passed through what at first seemed to be banana plantations. The fields were filled with the tall, wide-leaved banana plants, but between them were bushes covered with dark-green leaves and bright red berries, each about as big around as a small chestnut. We saw Indians picking these berries, and were told that they were gathering coffee, and that each of the berries contained two of the seeds which form the coffee of commerce.

When we ask as to the bananas, we learn that they are

Drying Coffee.

planted to shade the coffee bushes, and that the coffee is by far the more valuable product. Coffee plants are first grown from the seed in nurseries. They are then set out in the field and are cultivated. They produce at the age

of four or five years, and continue to yield for about twenty years, each bush giving from one to five pounds of coffee a year. After the berries are gathered, they are crushed to get off the hulls, and the seeds are then dried and cleaned for the market. Some of the best coffee of the world is raised in Mexico, and there are large plantations in those parts of the country lying between the plateau and the sea.

Higher up on the plateau itself the climate is too cool to produce tropical fruits. The region is a temperate one, and exceedingly healthful, the weather the year round being much like that of our country in June.

Along the borders of this great tableland the peaks of the mountains are covered with perpetual snow. The air is so pure that we can see many miles. The sky seems closer to the earth than at home, and at night the moon shines with a greater brilliancy, and the stars are more than ever like diamonds.

It is on the Mexican plateau that most of the people live. There are many large cities, some of which are more than a mile above the sea. In the northern part of the plateau are deserts like those we saw among the Rockies on our way to San Franciso. Here the only plants which grow are the cactus and sagebrush. The ground is white and glaring, and as we ride through on the railroads, our eyes grow sore and our nostrils are filled with a suffocating dust.

The surface of the plateau is rolling. Out of it rise many mountains containing gold and silver. It has rich valleys and well-watered plains, which are divided up into enormous farms called haciendas.

What would you think of traveling for eighty miles on a railroad through one single farm? There are haciendas even larger than that in Mexico, upon which great herds

of cattle, droves of horses, and flocks of sheep and goats are pastured. There are plantations farther south producing vast crops of tobacco and cotton; and wheat, corn, and barley can be raised almost anywhere upon the watered parts of the tableland.

There are few countries where crops grow more luxuriantly. The farmers use the poorest of tools, many of the plows being forked sticks shod with iron, which merely scratch the surface of the ground. Still, the soil is so rich that it will often produce two crops a year. I have seen men harvesting in one field while the same kind of crop was being planted in the field adjoining. We can pick roses almost anywhere in Mexico from January to December; and should we ride northward from Mexico city, we might pass through places where strawberries ripen all the year round.

Maguey Plant.

We see many curious plants. The cactus grows everywhere upon the highlands. There are several species of cacti in Mexico, some of which are very valuable. You may have seen century plants in your hothouses at home. There is one species of this plant family which grows best in Yucatan. It is henequen, or Sisal hemp, and is of great value on account of the long threads or fibers of which its leaves are composed. These fibers, when properly treated, can be

used for making bagging and ropes, and many of the hammocks we use are woven from them by the native Yucatan women.

There is another cactus which grows near Mexico city, the juice of which, if kept a few days, turns into a beer of which the natives are fond. This is the maguey plant. We pass through vast plantations of it on our way to the Mexican capital. The full-grown plants are so big that the smallest of them could not be crowded into a hogshead. The maguey has leaves from six to eight inches thick, which sprout up from the ground to the height of ten or twelve feet. Inside the leaves is a green cone as big around as a peck measure; and when the plant is ripe, a part of this cone is cut out, leaving a hole the size of a two-gallon bowl.

Into this queer bowl the sap runs down from the leaves in streams, each plant producing two, three, or four gallons of juice every day. This yield will continue for months, so that a single plant may produce several barrels of the liquor. At first the juice is quite sweet and milky in color. It begins to ferment in a very few hours, and within a day has turned to a beer and will make one drunk if he takes too much of it.

49. TRAVELS IN MEXICO

THIS morning we start out to explore the Mexican capital. We are in a magnificent city of more than a half million people. The streets are wide, and are paved with asphalt. They are thronged with automobiles, motor-cars, and carriages. They are lighted by electricity, and there are so many street car lines that if joined end to end they would reach from New York to Boston. The stores

have plate glass windows and are full of fine goods. Some of the public buildings remind us of Washington, and the great cathedral which stands in the center is the largest church in all North America.

Mexico is an historic city. Where it now stands was the ancient capital of the Montezumas, built long before Columbus discovered America. When taken by the Spaniards, A.D. 1531, it had one hundred and twenty thousand houses, being almost as large as the Mexican capital, which covers twenty square miles.

The best place to see the city is from one of the great

The Cathedral — City of Mexico.

towers of the cathedral. These are almost half as high as the Washington Monument, and as we stand upon them we have before us one of the finest views of our hemisphere. The Mexican capital lies in a beautiful

valley surrounded by mountains. Off in the distance, the two great volcanoes of Popocatepetl and Iztaccihuatl look down upon us out of their caps of perpetual snow; and the green fields of the valley are spotted here and there with lakes which shine like great shields of diamonds under the bright rays of the southern sun.

The city below looks like a checkerboard. It is divided into blocks of houses roofed with brick, and the wide

General View of the City of Mexico.

streets which bound the squares are often of asphalt. We see that the roofs are flat. There is not a bit of smoke rising from any of the houses. There are no chimneys to speak of, for the fuel is charcoal, which makes no smoke; and the cooking is done in little clay ovens. There are but few furnaces, and iron cooking stoves are almost unknown.

On the tops of many of the houses we see white and gay-colored patches floating to and fro in the breeze.

They are the family washings, which are often dried upon the roofs. Farther out upon the edges of the canals, at the outskirts of the city, are other patches of white. They belong to the laundresses. Much of the washing of Mexico is done in the streams, most of the clothes being washed in cold water.

Observe how the houses are built. Few of them are more than three stories in height. They stand close to the sidewalks, around little courts which form yards or gardens. Every large Mexican house has a court of this kind, and there are often flowers and trees growing in it.

Just below us, in front of the cathedral, is a big square, called the plaza, where the band plays every evening, and the people come to walk about under the trees. Such plazas are to be found in every city. The Mexicans are fond of music, and they spend much time out of doors. That long three-story building at the side of the plaza just below us is the National Palace, where the Congress of Mexico sits, and where the officers of the government work. Mexico is a republic much like our own. It has twenty-seven states, three territories, and a federal district. It is in that building that the President has his offices; and about him, in other rooms, are those of his cabinet ministers.

But let us go down from the cathedral and take a walk through the city. We find the streets almost deserted. It is now high noon, and the Mexicans close their stores at twelve o'clock, and rest during the hot hours of the day. They have their dinners between twelve and one, after which they take a nap or chat with their families until three, when they come back to work. The business hours are from nine to twelve in the morning, and from three to six in the afternoon.

By seven o'clock most of the establishments are closed, and the evening is given up to rest or to pleasure. After seven the poorer people go out to walk in the parks, and the richer drive out in their carriages upon the Paseo, or wide road which runs between the city and Chapultepec, the great hill on which is the summer home of the President.

Chapultepec.

We are surprised to see how many poor Mexico has. There are thousands of men who work for but a few cents a day, and families are supported on less than two dollars a week. The Spaniards and the mestizos, or the descendants of Spaniards and Indians, own the greater part of the wealth. The Indians and the poorer mestizos form the laboring class. Many go in debt to their employers, and work on from year to year, taking only a part of their wages, and allowing the remainder to go towards the payment of that which they owe. They borrow more from time to time, and thus keep themselves all their lives in a sort of

debt slavery. Such slaves are known as peons, a name which is often used for the poorer classes of Mexico.

We see many peons in Mexico city. The men dress in white cotton shirts and trousers, with their shirts outside of the trousers. They do not wear stockings. Their feet are shod with sandals of thick leather, and they have on broad-

Hut of a Peon.

brimmed hats with crowns a foot high. Most of them have a red blanket which they throw about their shoulders. The peon woman is usually barefooted and bareheaded. Her dress is of cotton. She wears also a shawl, which she drapes around her shoulders and sometimes draws over her head.

We see many peons in the market. They bring in vegetables, eggs, and other things on their backs from their little farms miles away. They sit down on the ground under umbrellas, with their wares piled before them.

Indian corn is the chief food of the Mexicans. Most

of the people here do not know what bread is, and hundreds of thousands have never tasted wheat flour. Many of them have never eaten meal ground in a mill run by machinery. The women are their own millers. Outside of the huts we can see them grinding the corn. They grind at one time only enough for a meal. The mill is two

Making Tortillas.

stones; one of which is round like a rolling pin, and the other a rough slab about a foot wide and eighteen inches in length. Before grinding, the grains of corn are soaked in limewater until they are soft. They are then laid upon the slab, and the woman, kneeling down, rolls the round stone over them, mashing them into a paste or dough. She forms this into a thick cake with her hand, and then lays it upon her fire of blazing charcoal. It cooks rapidly, and within a short time is ready for eating. Cakes so made are called tortillas (tor-tē′-lyäs). The peons eat them without butter, although they are sometimes seasoned with a dash of salt or red pepper. We taste them ourselves, and find them not at all bad.

There is one dish that is well served in every house here. This is black beans, or, as the Mexicans call them, frijoles (fre-o′-les). Frijoles are eaten by both rich and poor. It is not an uncommon thing to have them at the close of a meal.

The Mexicans have fine candies, and delicious chocolate is sold everywhere. The better classes live well. At noon they have a good dinner, each dish being brought in and served separately. None but the rich can afford meat very often; and in some cities the way meat is sold makes us think that it would be dear at almost any price. I once saw a butcher peddling beef in Guanajuato (gwä-nä-hö′-tō), one of the cities of the plateau. His meat wagon moved about on legs instead of on wheels. It was a dirty, one-eyed mule, upon whose back was a framelike saddle covered with hooks. The pieces of meat hung from the hooks down the sides of the animal, the blood dripping to the ground as it walked along.

The mountain districts of Mexico are among the most interesting regions. Since the discovery of America much silver has come from Mexican mines, and the Indians had vast treasures of gold and silver when the Spaniards conquered them. The Indian Emperor, Montezuma, gave Cortez, the Spanish general, plates of gold as big as wagon wheels, and golden spurs for his horses. To-day hundreds of mines are worked for the precious metals, and a great deal of copper and iron is also mined. There are oil fields that yield millions of barrels of petroleum. In 1913 a well was sunk that flowed one hundred and ten thousand barrels of oil every twenty-four hours. Several million barrels went to waste before the flow could be stopped.

But before we leave this country we must see a volcano. Mexico has a number of these wonderful mountains, which

now and then vomit forth sulphur, lava, and steam. One of the greatest of them is Popocatepetl, which is visible from any part of Mexico city.

Popocatepetl is one of the high mountains of this continent. It is more than three miles above the level of the sea. We ride upon the railroad to the town of Ameca Meca, at the foot of the mountain. Here we take sticks shod with iron to keep us from falling, and hire guides who have ropes to help us over the ice and snows.

For the first few hours our way is through a pine forest. Then we climb up hills of volcanic rock, through loose,

Popocatepetl.

shifting black sand. As we rise higher, the trees become smaller, and at last we come to a region above which nothing grows.

We soon reach the line, where, from year's end to year's

end, the ice never melts. As we cross this, the snow is soft, but higher up it becomes harder and harder. The air grows colder and thinner, and at times we feel faint and sick. How our hearts beat! The glare of the hot sun on the snow dazzles our eyes, and our hands are torn in pulling ourselves from point to point over the ice. At last we reach the top, and stand on the edge of the crater of the greatest volcano in North America.

Popocatepetl is not now throwing stones, rock, and lava into the air, but it is always vomiting out fumes of sulphur. We have to get to the windward of the volumes of blue and yellow brimstone smoke which rise out of the great hole in the top of the mountain, before we can look down within. The crater is almost a mile wide at the top, and it is more than one thousand feet deep. The walls slope inward, and by peeping over we can see scores of Indians at work gathering the sulphur and carrying it to the top, from where it is slid down the mountain in a sort of chute, to be prepared for the markets. This sulphur is said to be pure, and a great quantity of it is taken out and sold every year.

50. CENTRAL AMERICA

CENTRAL AMERICA is the next country through which we shall travel. Beginning at the southern boundary of Mexico, it extends in a southeasterly direction to where the Isthmus of Panama joins South America, a distance as great as from New York to Chicago. Its general character is somewhat like that of Mexico, with tropical lowlands and a central strip of plateau upon which are high

volcanic mountains. The people are similar to the Mexicans, save that there are more Indians. (Map, p. 397.)

Much of the country is wild and rough, and a great part of our travels will be upon mules; and at times we shall have to go on foot to explore the mahogany forests and the valleys where the rubber trees grow. In the mountains we frequently pass mining camps, and in places see Indian women washing gold out of the streams.

The weather here is hotter than in the lands farther north. It grows still warmer as we move on towards Panama, and down in the lowlands the vegetation is more and more tropical.

We find that all the little republics which form Central America have coffee estates. Guatemala, Salvador, and Costa Rica produce millions of pounds of excellent coffee, the most of which is exported to Europe; and there are coffee plantations in Nicaragua, Honduras, and Panama. The coffee is raised on the sides of the hills above the low coast lands and also upon the plateau.

In the low country bordering the Caribbean Sea are large plantations where bananas are grown. This is especially so in Costa Rica and Nicaragua and to a considerable extent in Honduras as well. The chief market for the bananas is the United States, and great quantities of them are carried from here to New Orleans, Mobile, New York, and Boston and from there shipped all over our country.

Bananas are started from suckers from the plants already grown. These suckers are set out about fifteen feet apart. They soon take root and grow rapidly, often reaching a height of fifteen or more feet. At the age of ten months the first fruit can be gathered. Large bunches of green bananas now hang down from the stalks of the plants. Each bunch is cut off where it joins the stalk, and

A Banana Plantation.

while still green is put upon shipboard. It takes several days for the steamers to reach our markets, and the bananas ripen during the voyage.

Another product of Central America which finds its way to all parts of our country is chocolate or cocoa. It is made from the seeds of the fruit of the cacao tree, which is cultivated in Mexico and Central America. The tree is planted and carefully cared for. After a few years it bears a red or green fruit, shaped like a melon, and about eight inches long. In this are the seeds known as chocolate nuts or cacao beans. The seeds are oily, and are allowed to ferment before they are dried. They are then ground into a paste which, pressed into cakes, forms the chocolate sold in our stores. Some of the oil is taken out in the process of preparation.

Much of our journey in Central America must be through the forests. No other part of the grand division has such dense woods as here. The trees grow to a great height and thickness. They are bound together by snakelike vines, and the vegetation is so dense that in passing through the woods it is impossible to advance more than a few miles a day.

Travel is quite dangerous in the forest regions. There are poisonous snakes. There are centipedes, scorpions, vipers, and all sorts of horrible creeping things. We see

A Hut in Central America.

many wild beasts. There are panthers and jaguars, herds of peccaries, or wild hogs, and monkeys by the hundreds jump from tree to tree. There are humming birds not

CENTRAL AMERICA
AND
WEST INDIES
GULF OF MEXICO
CARIBBEAN SEA
ATLANTIC OCEAN
PACIFIC OCEAN
WEST INDIES
SOUTH AMERICA
CENTRAL AMERICA
FLORIDA
Florida Strait
Nassau
ELEUTHERA
NEW PROVIDENCE
ANDROS IS.
CAT I.
SAN SALVADOR OR WATLING I.
EXUMA
LONG I.
BAHAMA IS.
ACKLIN
MARIGUANA
CAICOS IS.
TURKS IS.
GT. INAGUA
TROPIC OF CANCER
HAVANA
Matanzas
CUBA
Cienfuegos
C. San Antonio
P. Progreso
Yucatan Channel
ISLE OF PINES
Merida
YUCATAN
Cauto R.
C. Cruz
Santiago de Cuba
Windward Passage
Mole St. Nicholas
Cape Haitien
Puerto Plata
HAITI
DOMINICAN REPUBLIC
PORTO RICO
GONAVE I.
PORT AU PRINCE
JAMAICA
KINGSTON
SANTO DOMINGO
Mona Passage
SAN JUAN
Ponce
VIRGIN IS.
ANGUILLA
ST. MARTIN
ST. BARTHOLOMEW
BARBUDA
ANTIGUA
ST. EUSTACE
ST. CHRISTOPHER
MONTSERRAT
GUADELUPE
DOMINICA
MARTINIQUE
ST. LUCIA
ST. VINCENT
BARBADOS
GRENADA
TOBAGO
TRINIDAD
GRAND CAYMAN
BELIZE
Usumacinta R.
Motagua R.
Gulf of Honduras
Trujillo
Puerto Barrios
GUATEMALA
Quezaltenango
Puerto Cortez
HONDURAS
C. Gracias a Dios
Vol. Fuego
Vol. Agua
NEW GUATEMALA
TEGUCIGALPA
Ulua R.
SALVADOR
SAN SALVADOR
NICARAGUA
G. of Fonseca
Corinto
León
Managua
MANAGUA
Bluefields
L. Nicaragua
San Juan del Norte (Greytown)
COSTA RICA
Limon
Punta Arenas
SAN JOSE
ISTHMUS OF PANAMA
Panama Canal
Panama
Gulf of Panama
Gulf of Darien
COLOMBIA
Pt. Gallinas
ORUBA
CURACAO
BUEN AYRE
Barranquilla
Cartagena
Magdalena R.
Maracaibo
Lake Maracaibo
La Guaira
CARACAS
TORTUGA
MARGARITA
VENEZUELA
Orinoco R.
SCALE OF MILES
0 100 200 300 400 500
90 Longitude 80 West from 70 Greenwich 60
POATES ENG. CO., N.Y.

much larger than bumblebees, and wild parrots and other birds of the most gorgeous plumage.

Here and there, in the woods, we find lumber camps, where men are cutting down mahogany, ebony, and rosewood to be shipped to all parts of the world for making furniture. The camps are usually on the banks of a river, the logs being dragged by oxen to the stream, and floated down to the seacoast. A mahogany camp consists of a collection of log cabins, in which from thirty to fifty men live and work under an overseer called a captain. There is one man among them, known as the hunter, who goes through the forest and picks out the trees fit for cutting. He knows a mahogany tree as far as he can see it, and he understands just how large it should be to make good lumber.

The mahogany tree grows to an enormous size in Central America, its trunk often being sixty feet high before the branches begin. At certain times of the year the leaves are colored as brightly as the leaves of our forests in autumn. It is this color which forms the guide to the hunter, who, having climbed to the top of some high tree, picks out with his eye the places where the mahogany trees are, and plans just how to get to them. No trees are cut which are less than eight feet in circumference, and it has been calculated that a mahogany tree must be three hundred years old before it is ready for lumber. The wood is of such value that it brings very high prices.

There are also India-rubber trees. In Central America these trees do not grow more than fifty feet high. In gathering the sap, they are sometimes cut down; or they may be left standing, and the bark cut away in strips from the top of the tree to its roots. Holes are then made in the ground at the ends of the strips, and these are so

plastered with leaves that they make a tight bowl in which the sap is caught as it oozes out and drops down. After the sap has been collected, it is smoked to harden it into cakes for the markets.

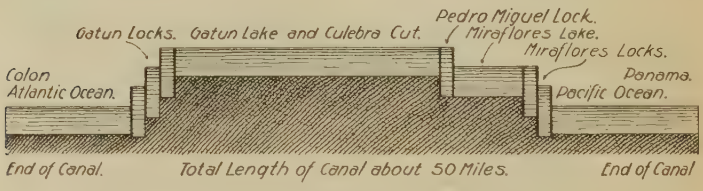
The cities of Central America are few and all are comparatively small. Some of them have railroads that connect them with the ports on the oceans, but others are

Native Shop in Guatemala.

accessible only by stage or on muleback. Nearly all are growing, and the countries are improving in their means of transportation. They are advancing in civilization and wealth and are sending more and more of their products to other parts of the world. They have good harbors on the Pacific Ocean or the Caribbean Sea. Their prosperity will steadily increase now that the Panama Canal is in operation, and they will be more closely allied to us in commerce and trade.

51. THROUGH THE PANAMA CANAL TO NEW YORK

WE have now about completed our long tour of the North American continent. We have traveled through all of its countries from Alaska to the Isthmus of Panama, and are now at Balboa, or Port Ancon, which is near the city of Panama. We are at the Pacific end of the Panama Canal, and are ready to take the steamer which



"A great water bridge from ocean to ocean."

shall carry us across the Isthmus into the Atlantic Ocean and back home to New York.

Were it not for the Panama Canal, if we wished to go all the way by sea, we should have to travel thousands of miles southward along the western coast of South America to the Strait of Magellan. We should have to steam two hundred miles through that strait to get into the Atlantic Ocean, and then should be still six or seven thousand miles south of New York. If we traveled day and night, the whole of the sea journey would take more than a month, whereas by the canal we can be home in about one week from the time we leave here.

The Isthmus of Panama is the neck of land that ties the continents of North and South America together. It

consists of a range of low mountains which, where we are now, is so narrow that we could cross it by automobile in two or three hours, or upon foot in two days. Just opposite us along the line of the canal is the Culebra Pass which, although it crosses the mountains, is not as high as the tallest office buildings of our larger cities. The Isthmus does not seem great, but nevertheless until now it has acted as a mighty wall between the Atlantic and the Pacific, blocking the commerce of the world. Ships could come from either of the two oceans to the wall, but to go from one to the other they had to travel thousands of miles out of their course. It took them many weeks to go by way of the Strait of Magellan or around Cape Horn from one side of the United States to the other, and parts of Asia, Australia, South America, and Europe, so far as the sea routes between them are concerned, were thousands of miles farther apart than they are now.

And so, from time to time men planned to dig a waterway through the Isthmus, and make this a short cut from ocean to ocean. The work was so great, however, that it was not until 1880 that any one dared to attempt it. At that time a French company with plans made by the famous engineer, Ferdinand de Lesseps, began the work. De Lesseps had already built the canal through the Isthmus of Suez, which joined Africa and Asia; and he was thought to be just the man to cut through the isthmus which joined North and South America.

However, the French found that digging a ditch through a level desert of sand like that of the Isthmus of Suez was far different from cutting a canal through the Isthmus of Panama, where the mountains had to be blasted down; where vast amounts of earth and rock had to be moved out of the way, and where mighty dams had to be built to con-

trol the floods. They began their work extravagantly, and had spent several hundred million dollars before the people who had invested in the canal became dissatisfied and would give no more money. Thereupon the French company sold the right to build the canal, including all the work that had been done, to our government for the sum of forty million dollars.

By that purchase we acquired a strip of territory ten miles wide running from one side of the Isthmus to the other. This is called the Canal Zone, and through the middle of it we have dug our great waterway. We have used a little of the work done by the French, but have had to do many times as much more and have so changed the character of the canal that it is an American work throughout.

Ferdinand de Lesseps's plans proposed a sea-level canal like that at Suez. He planned to cut down the pass through the mountains to the level of the two oceans so that the vessels could steam right through from one to the other. These plans were found impossible by our engineers, and our canal is a lock canal, only about one third of it being on the level of the ocean, and about two thirds, or almost thirty miles, being on a plain which is eighty-five feet above that level. At either end of the elevated portion are three great locks by means of which the ships are raised or lowered up to or down from the higher part of the canal, through which they sail as over a great water bridge from ocean to ocean. The locks are somewhat like those we saw in the Great Lakes. They might be called the steps on each side of the bridge (see diagram, page 400).

The elevated part of the canal has been made by cutting down and blasting out the earth and rock of the Culebra Pass through the mountains so that the water in the canal

is at the level of eighty-five feet above the sea, and also by damming the Chagres River so that a lake has been formed at that level. The dam is known as the Gatun Dam and the lake is Lake Gatun. It is the waters of Lake Gatun that flow through the pass, and fill the locks that raise and lower the ships. Therefore all of the water in the higher part of the canal is fresh water, and it is only after the ships have passed out of the locks down to sea-level that they are again in salt water.

The entire length of the canal is about fifty miles, and its length from shore line to shore line is about forty miles. There are great port works at each end of the canal, and electric light towers have been built along the channel so that ships can go through it by night as well as by day.

The locks are much more wonderful than those of the Great Lakes. Each lock is one thousand feet long and big enough to hold the largest ship afloat. The gates to the locks are of steel, and they comprise millions of pieces so closely fitted together that they keep out the water. They are moved by machinery, whose motive power is electricity generated by the fall of the waters of Gatun Lake over the spillway of the dam. The ships do not use their own steam in the locks, but they are towed through them by little electric locomotives which permit them to go just so fast and no faster. The time required to pass a vessel through all the locks is about three hours, and a single lock can be filled and emptied within fifteen minutes.

The story of making the canal is so wonderful that it would take a large book to describe it. Its cost altogether was about three hundred and seventy-five millions of dollars. The United States had also to spend millions more in building the great fortifications, which are necessary to its defense. They are on the islands near the entrances and

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"We are at the Pacific end of the Panama canal."

along the line of the canal. Our government has a railroad through the Canal Zone that runs from one side of the Isthmus to the other, and it keeps a large force of Americans busy in running this road, in operating the machinery of the canal, and in managing the docks, warehouses, coaling stations, and other establishments at either end.

In entering the canal from Port Ancon, we steam in on the level of the Pacific Ocean and go over eight and a half miles before we come to the two mighty locks in which our steamer is lifted fifty-five feet to the level of Lake Miraflores. We steam through the lake for one mile and a half, and then enter the lock of Pedro Miguel (pā′dro mee-gel′). Here the gates close behind us, the lock fills with water, and our steamer slowly rises about thirty feet. We are now eighty-five feet over the sea and on the level of the water in the Culebra Cut. The gates in front of us open, and we steam through this cut for a distance of nine miles into the great Lake of Gatun (see diagram).

During this part of our journey the hills are high over our heads. The cut was blasted out of the mountains and the deep canyon through which we steam has been cut right through the hills. So much earth and rock had to be moved in making this part of the canal that it would more than fill a ditch a yard wide and a yard deep twice around the globe and still leave enough over to equal that of a tunnel through the center of the earth big enough for a grizzly bear to crawl through.

We see but few signs of the work as we go onward. The banks of the cut are now covered with green, and there are wild flowers blooming on the edge of the water. We steam out of the cut into Lake Gatun and wind our way through it for a distance of twenty-four miles to the great

dam, at one side of which the Gatun locks are. These locks have three levels, and through them we drop from one to the other down to the channel that leads out to the Atlantic Ocean. The distance from the locks to the ocean is only about seven miles, and within a short time we are in Limon Bay, at the docks of Cristobal, near the city of Colon, at the Atlantic end of the canal, and ready to start on to New York.

Our trip through the canal has taken us a little more than ten hours, and in this time we have saved the eight thousand miles more that we should have traveled had we been forced to go by the Strait of Magellan.

Now we have left Cristobal, and are out of sight of land, steaming over the wide Caribbean Sea. The air is fresh, the water is blue, and schools of silvery flying fish dart from wave to wave. A little later we pass the blue hills of the Island of Jamaica, and on the following days catch glimpses of Cuba and Haiti as we sail between them. We next pass San Salvador, where Columbus landed when he first came to this side of the world. Thence we steam through the warm waters of the Gulf Stream northward along our Atlantic coast. It is stormy as we pass Cape Hatteras, but the sea is smooth as we round Sandy Hook, and the weather is fine as we pass the great Statue of Liberty and come to anchor at the wharves of New York.

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